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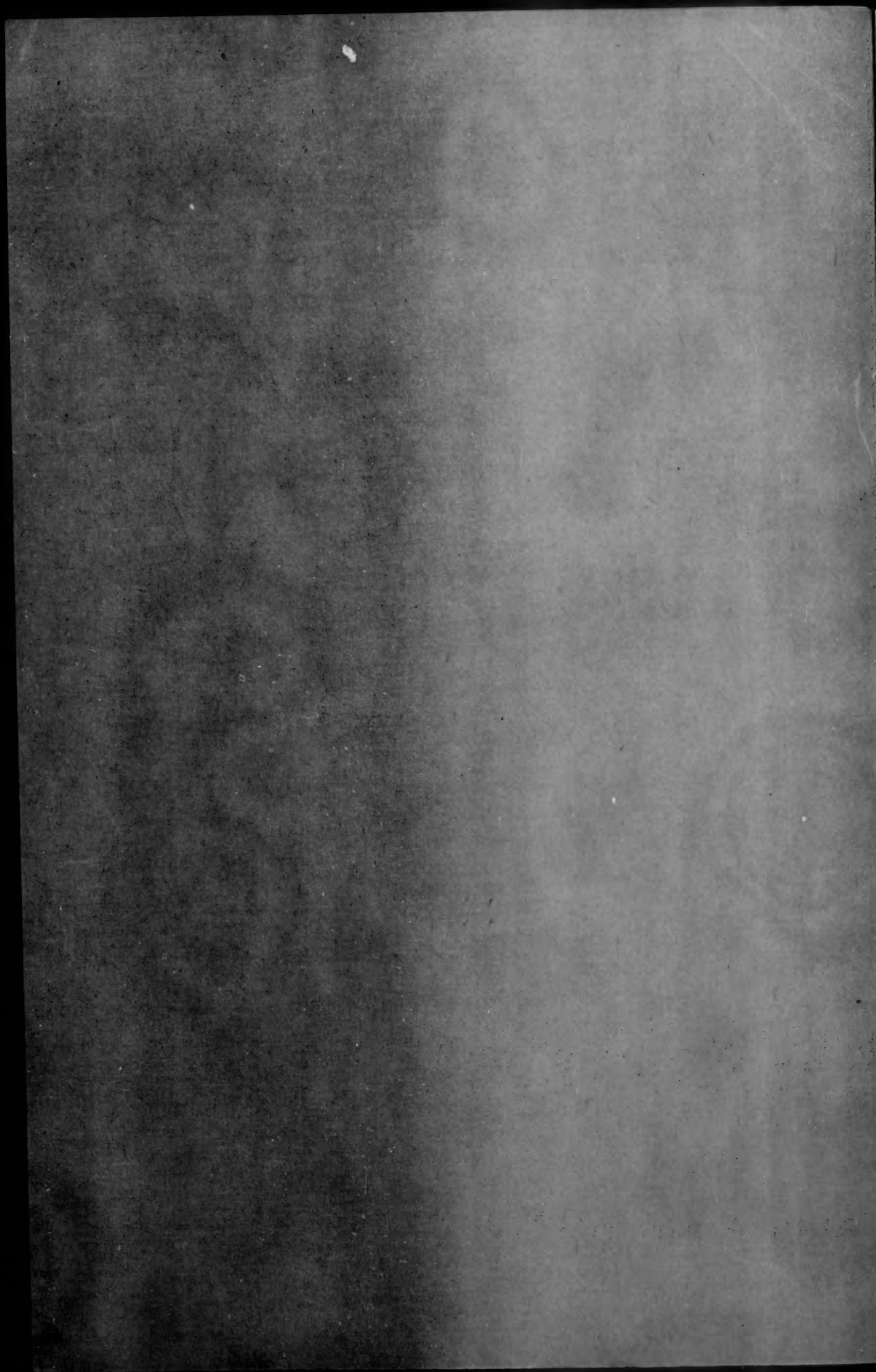

THE AMERICAN JOURNAL OF PSYCHIATRY

ATOMIC ENERGY IN MEDICINE[1]

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At the beginning, I should like to state the plan of what I have to say to you today; or better perhaps—what I want to leave in your minds and how I hope to do it. I shall present a brief picture of the activities of the Division of Biology and Medicine of the Atomic Energy Commission and a more detailed picture of the effects on human beings of an atomic explosion. In other words, my first theme will be "the most important advance in biology and medicine since the invention of the microscope," for that is the term applied to radioactive isotopes. My second theme will be "the most destructive weapon for war in all history." Why should I dare to combine the opposite poles of the compass? I dare to because I would like to give you a picture of these fields so that you will be stimulated to seek more knowledge about the broad picture of atomic energy. You should do this immediately for it is the duty of physicians to be acquainted with the real facts about atomic energy. It is their duty to be familiar with the known results of an atomic explosion and the humane uses of atomic energy and its products. It is *not* their duty nor is it anyone's duty to speak glibly about the number of atomic bombs that they think would be required to contaminate the universe, nor is it their duty to draw up ghastly pictures of the citizens of Washington dying from radiation syndrome. Perhaps this is good propaganda for sensationalists, but not for scientific men. With these thoughts in mind, let us take a look at the facts.

The original functions of the biological and medical group in the Atomic Energy Project were to maintain the health of the workers on the Project. This included the usual activity in industrial health, plus careful control of the radiations which are emitted in the course of the work. This problem itself deserves some realistic thinking. I think that I can best give you an idea as to the scale in which radioactivity must be controlled by recalling that the column of water thrown up by the underwater explosion of the atomic bomb at Bikini contained the equivalent of more than 100 tons of radium. Remember that the types of radiation encountered in this project were the same types of energy that had been encountered and handled for some time by physicians who had worked in these fields. The dentist who takes several full mouth X-rays a day receives more radiation than the average worker at Oak Ridge who handles uranium for an atomic bomb. Recently a Safety and Industrial Health Advisory Board including distinguished safety engineers, sanitary engineers, and industrial hygienists inspected the laboratories and production plants of the Commission. Their report stated, "The insidious danger of radiation damage receives a spotlight in the popular and technical press which is out of proportion to the hazard in comparison with the injury risk in many other industries (for example the chemical industry in general where there are many late (delayed) injuries as painful and damaging to the victim as those due to radiation)."

While the outstanding record in industrial and scientific safety has been constantly maintained, many other aspects of the program have been developed. With the introduction of new elements which had not been encountered in any amount before, and in view of the radioactivity of these elements, intensive research was indicated to determine how they were handled by the living body. This required expanding activity in the A.E.C. laboratories, plus an extension of the work to certain civilian institutions. Accordingly, a great deal of valuable scientific knowledge has been accumulated.

With the cessation of the war and the activation of the civilian Atomic Energy Commission, it soon became apparent that one

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of the greatest available contributions to science—and one which was, in general, readily available—was the radioactive isotope. To risk repetition, you will recall that a number of the elements will become unstable when exposed to a strong source of fast-moving nuclear particles. These particles make the elements unstable by striking their nuclei, as it were, and jarring them about until they themselves emit waves or similar particles. These particles are detectable by machines, which it appears will soon be a part of each medical school laboratory. The hours, days, or years, during which these are emitted vary from element to element. Accordingly, we have a form of the element which can be detected in minute amounts because it is radioactive and yet which retains all of the usual chemical properties of the element. Thus if we place a piece of sulphur in the pile at Oak Ridge and allow it to remain for a time, it will be changed to a form of phosphorus which is radioactive. This phosphorus can then be injected into the blood stream to treat polycythemia vera, or, what I really think is much more important, it can be introduced into a variety of bodily compounds such as the red cell. Six years ago a skilled chemist would have had to work for about 4 days to detect a millionth of a gram of phosphorus, while at present a Geiger counter and a technician can detect one millionth-of-a-millionth of a gram in about 5 minutes.

I would like to mention a few of the uses to which these radioactive isotopes have been put: (1) the refrigerated blood program of the Navy was developed through studies of the survival of red cells with radio-iron; (2) radioactive sodium has been used to verify the conception of salt retention in heart failure and especially the decrease with mercurial diuretics or salt restriction; (3) the formation of the bile pigments has been studied with nitrogen as has the formation of proteins; (4) radiophosphorus appears to be the best means of treating polycythemia vera. It is hoped that we may increase our knowledge regarding the fundamental mechanism of cancer with radio-isotopes.

In order to understand better the relation of the products of nuclear fission to cancer the Commission has instituted a cancer research program which includes the free distribution of isotopes for cancer research, the support of selected projects in this field, and the establishment of cancer research facilities, including clinical investigations at certain of the regional laboratories.

The rapidity of development in nuclear physics as it applies to biology and medicine has left a real shortage of biological and medical scientists who are trained in this field. Accordingly, we have established an Atomic Energy Fellowship Program which is administered by the National Research Council and which offers the opportunity for 2 years of intensive training in this field. An initial group of fellows has already been selected but many more applicants and many more fellows are desired. Urge your students and residents to inquire regarding this program, for surely the opportunities are great on this limitless horizon.

Now to rotate our compass and consider the effects of an atomic explosion. The explosions of the atomic bombs at Hiroshima and Nagasaki produced an effect which was not only physically shattering but also mentally devastating. In the days immediately succeeding these attacks, the Japanese medical facilities were totally disorganized and it was not until the arrival of teams of American physicians that there was any semblance of an evaluation of the extensive injuries produced by the bombs and an attempt at organization and administration of competent medical care. Fortunately these teams included physicians who were skilled in the broad fields of radiation, and, with the passage of time, a great deal of valuable material has been accumulated regarding the effects of an atomic explosion. To increase our knowledge in this field, the President directed that an Atomic Casualty Commission be established as a long-term study group to evaluate carefully the effects of the explosions. You may be interested in hearing about the present status of these studies both as to immediate and delayed effects.

At the beginning it is important to realize that in many respects the explosion of an atomic bomb is in no qualitative sense different from the explosion of any other bomb of similar force. Your understanding of this may be furthered if I remind you that the

explosion of 1 kilogram of uranium-235 is equivalent to the explosion of 20,000 tons of T.N.T. Thus we should expect that our first injuries could be from the blast of the bomb itself. As you may know there is considerable discussion among physiologists as to whether or not there is such a thing as *blast effect*. It should be remarked that there were very few if any evidence of effects which could be dogmatically attributed solely to blast. Perforated ear drums, a recognizable blast effect, were seldom if ever seen—this despite the high incidence of chronic otitis media in the Japanese. However, the indirect blast effects were widespread and devastating. Several factors in the construction of Japanese cities contributed to these developments. As you know, the Japanese home is of flimsy, wooden construction with a tile roof which is easily removed. The Japanese streets are quite narrow, making entry and exit difficult. Accordingly, there were widespread damage and suffering from the collapse of homes around, and on, their inhabitants, as well as from large segments of Japanese homes that were blown through the air. Water mains were ruptured, streets torn up, and raging fires were ignited.

Those of you who have a head for figures may recall that the casualty figures ran to 80,000 dead and 80,000 injured at Hiroshima, with 40,000 dead and 40,000 injured at Nagasaki. Why the difference? We think that it is accounted for by the geographical configuration and location of the 2 cities: Hiroshima is surrounded by high hills and mountainous islands which would contain the force of the explosion; Nagasaki, however, lies as a tricapitate hydra with more opportunity for segregation of the effects of the explosion.

A chain reaction which occurs in a short time liberates enormous amounts of heat which scatter over an extensive area. Those who attended the first test at Alamagorda tell me that they could feel a wave of heat strike their faces at a distance of 12 to 15 miles. This heat produced by a rolling flash causes severe and extensive burns. Fundamentally these burns are in no sense different from other thermal burns. However, there are several interesting features about them which are worthy of mention. First is the fact that there is a remarkable amount of shadowing effect produced by even the flimsiest of materials, such as a shoulder strap, a shirt, and the like, up to 4½ kilos. It was easy to determine which way a person had been facing at the time of the blast by the silhouette of the burns on his body.

It is also interesting that these burns were frequently associated with rather extensive hyperpigmentation and that this seemed more prone to occur with mild burns. In addition, the study groups which have visited Japan more recently have found a high incidence of keloid formation in the scar from the burns. This appears to be a racial characteristic; for a similar keloid formation has been noted in some of the scars following burns from the fire bombs which were dropped on Tokyo.

The radiations produced by an atomic explosion may arise in several ways. First, at the time of the explosion, there is liberated a dense flux of highly penetrating radiations which burst in all directions. Subsequently, a great number of intensely radioactive fission products appear within a cloud which rises slowly from the point of explosion. In an air explosion this cloud is carried into the substratosphere and the stratosphere; consequently, there has been little, if any, residual radioactive contamination in the Japanese cities. However, in the underwater burst of a bomb, the situation is reversed, for the great geyser which is thrown up is intensely radioactive and as this geyser falls on surrounding objects it deposits on them a heavy residuum of radioactive particles. For this reason, you may still read in the papers that certain ships which were at Bikini as targets have had to be sunk because of the radioactivity remaining in them from the test almost 2 years ago. A third method of transmission of the radioactivity by the bomb occurs when the liberated radiation strikes elements in surrounding objects. Thus, sulphur in the insulators on power lines may be converted to radioactive phosphorus and thereby liberate radioactive emanations for a number of days after the explosions.

Actually there are several different types of radiation which we are discussing. The alpha particles are highly ionizing (that is to say, destructive) yet they fortunately

penetrate very poorly if at all. The beta particles however are not so damaging but are superficial penetrators, that is, up to 8 mm. In contrast, note that the gamma radiations which are quite similar to x-rays are deeply penetrating but, comparatively, the least damaging of the three. The fourth particle—the neutron—carries no charge, and, accordingly, is deeply penetrating and also highly destructive. These neutrons are liberated in large numbers when a bomb explodes. When an alpha particle has penetrated the body, by inhalation or through the lacerated skin, the damaging radiation is picked up rapidly by the blood stream and carried to the bones where it lodges and continues its harmful activity (see illustrations).

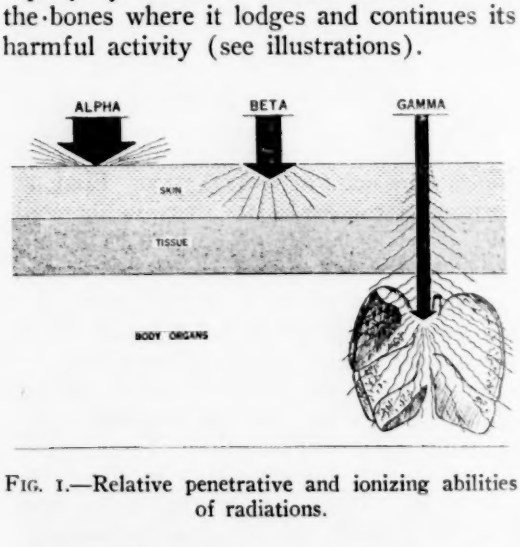

FIG. 1.—Relative penetrative and ionizing abilities of radiations.

What are the effects of these radiations on the human body as demonstrated by the Japanese survivors? First, let us understand that, over all, the effect on the tissues of all of these particles is about the same (be they neutrons, alpha particles, or the rest). The differences (similar to sexual differences) are largely quantitative and not qualitative. A second point is that there is considerable individual variation in sensitivity to radiation. This was strikingly illustrated several years ago when three workers with a cyclotron were, through an accident, exposed to a dangerous overdose of radiation. One of the workers showed a severe reaction, another showed a mild reaction, and the third showed no change. Thus, the syndromes developed in the Japanese by the radiations depended, first, upon the amount of radiation to which they were exposed, secondly, the length of such exposure, and thirdly, the individual sensitivity to radiation. Needless to say, the presence of acute or chronic diseases would play a part in the eventual outcome.

The tissues of the individual's body also vary in their susceptibility to radiations—thus the bone marrow and the lymph nodes are relatively susceptible while the brain and the remainder of the nervous system are resistant, as compared to other tissues. Needless to say, we have done a great deal of experimental work on the actual changes that occur in the body when a person receives an excess dose of radiation. In experiments which Dr. William Bloom reported in *Radiology*, September, 1947, there were not found to be any effects from x-rays and other forms of

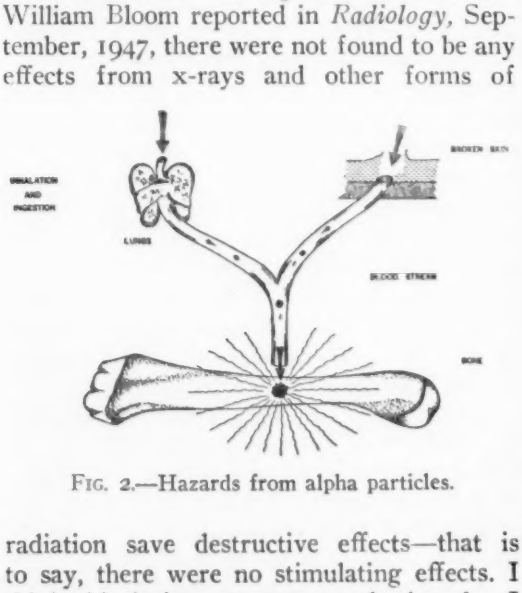

FIG. 2.—Hazards from alpha particles.

radiation save destructive effects—that is to say, there were no stimulating effects. I think this is important to emphasize, for I have heard many physicians refer to stimulating doses of radiation, and factual evidence will not support such empirical therapy.

It is difficult to segregate various clinical syndromes in human subjects exposed to radiation, but the patients who were studied in Japan tend to fall rather naturally into several groups, chronologically. In all patients certain clinical manifestations are preeminent: namely, gastrointestinal disturbances, hematologic changes, and hemorrhagic manifestations.

The first group includes those individuals who received an almost immediate lethal dose of radiation. Accordingly, 24 to 48 hours after the explosion they were afflicted with intense nausea, vomiting, diarrhea, prostration, and high fever. Many patients,

characteristic of this group, succumbed, while others survived after 3 or 4 days of such illness.

In those patients who survived this initial stage, and, in many others who showed no immediate reaction, there soon began a fall in the blood lymphocyte count which was quite soon associated with a more gradual fall in the granulocyte level. Accordingly, the total white blood count fell rapidly and there was a high incidence in cellulitis and sepsis. Since most of these people already had extensive infected burns, pathogenic micro-organisms had easy access to their bodies. Associated with these changes were severe gastrointestinal symptoms as mentioned above, and at autopsy the bowel showed severe ulcerative changes. The peripheral white blood counts ranged from 0 to 1,000 in these cases. Patients in this group died 4 days to 4 weeks after the explosions at Hiroshima and Nagasaki.

In some of these cases there developed concurrently, and in others subsequently, severe hemorrhagic manifestations. These included petechiae, purpurae, and gross bleeding from mucosal and serosal surfaces —gastrointestinal tract, pleurae, etc. There is much conjecture as to the cause of this bleeding. Is it due to a circulating anticoagulant, blood vessel injury, or some other alteration in blood constituents? The report on the use of rutin in protecting dogs from radiation damage needs much extension and substantiation before we can make any definitive statements as to its value.

Many patients presented themselves with a pancytopenia as a more delayed manifestation. Fortunately, a majority of these patients showed a gradual return of their blood counts to normal levels. The red blood cells show much less sensitivity to radiation and accordingly the red count falls more slowly, does not reach such low levels, and returns much more quickly.

One manifestation of radiation injury, in almost every instance, is loss of scalp hair. Note that I do not say axillary or pubic hair, just scalp hair. It is interesting that this loss of hair may be permanent, and if it is permanent, the patient has received a dose of radiation which is fatal. Many patients are now showing a definite regrowth of hair.

What are the recognizable sequelae to the explosions? First as to cancer and allied diseases. There has been no increase in incidence, including leukemia, among the survivors. Thus far, there have been 8 proven cases of leukemia which, compared with the usual incidence, is not significant. However, there are a number of patients who show a hyperplastic bone marrow by sternal puncture, and we recognize that such a change may precede leukemia. These patients showed a normal peripheral white blood count and differential count.

Sterility is an ugly word which rears its head whenever one talks about radiation; yet there are very few people who are sterile from radiation, for the sterilizing dose is so near the lethal dose. This is more frequent in males, and it is felt that the transient menstrual abnormalities which developed in females were due to psychic trauma rather than to organic aberrations. We have seen no instances of genetic change at this early date, but continuing studies will reveal the answer to this problem. Here, as in sterility, there is a certain totalitarianism about it all, and the alterations that occur in the genes are usually sufficient to be lethal.

It is felt that the accurate long-term studies planned by the Atomic Casualty Commission will assist in unravelling many of the questions regarding the effects of radiation on the human body. However, there is already an amount of material and experience available which permits of considerable understanding of the problem. There were certain factors which contributed to the extremely high mortality rates in Japan which would not be true in other countries. First, the construction of the two cities which promoted the widespread fires and devastation which followed the blasts. Many people died from burns received in the raging fire in the tinder-box homes while many others died when the flimsy structures collapsed about them as a result of the blast. A second factor which was unique for Japan, and which contributed heavily to the high mortality rates, was the total disruption of medical care. I think that it is very important to realize that medical observation and treatment of the Japanese did not begin until about one week after the explosion of the bombs except for a

very few survivors. It is easy to see that in the face of developing leukopenia, a lack of medical care may allow the development of severe sepsis, meningitis, etc. Another factor that should be considered in attempting to evaluate the results of the attacks is that—given a physician, surgeon, etc., given a clean hospital bed and an attentive nurse, given a well stocked Japanese pharmacy—the victims still did not have adequate medical care as we measure it in the United States today. We know that the following points in our therapeutic armament are essential—a good blood bank, a good supply of plasma, good supplies of intravenous glucose and saline, large amounts of penicillin and streptomycin, and, most of all, careful, attentive physicians skilled in the maintenance of normal electrolyte patterns, the recognition and care of surgical emergencies, and in the use and abuse of antibiotics. Those things we have; those things they had not.

Dr. Shields Warren, who has made several careful studies of the survivors, tells me that he knows of no cases of mental illness resulting from the atomic bomb explosions. I understand that there was very little mental illness in the Japanese before the war, and that the peculiar facets of the Japanese character were such as to fit them admirably for the successful resolution of the psychical aberrations that might result from such a catastrophe. One wonders how our fellow countrymen would react in such a situation.

It is the real responsibility of physicians to participate in the education of the people as to the why-and-the-wherefore of atomic energy. As Mr. Lilienthal has so clearly stated, one of the big deterrents in public education has been the lack of time in which it might be accomplished. Our minds were changed overnight from the idea that nuclear physics is a research laboratory and classroom problem to the understanding that we live in a world where nuclear physics has developed the greatest explosive force ever known.

I am sure that as the country's leading psychiatrists you can appreciate and suggest to us the many problems that relate to the good common-sense understanding of atomic energy. Be the problems as they may, I think that we will all agree that the need is urgent for such understanding.

It seems that physicians have a peculiar responsibility in this problem for the following reasons. First, because a great deal of the public misinformation has been in regard to the biological and medical aspects of atomic energy. We should all deprecate the unfounded and nebulous statements that emanate from too many physicians as to what an atomic explosion will do to the blood cells and other tissues of the human body. Similarly, we should all deprecate the claims that have been made as to what radioactive isotopes can do in diagnosing and curing diseases, especially cancer. We know that radioactive isotopes have already unlocked a number of knotty problems in the basic medical sciences which have pronounced indirect clinical application. We also know that radioactive isotopes have not been shown to cure any cancer in any patient with whom we, or our Isotope Branch, are acquainted.

The advances in psychosomatic medicine in the past few years have emphasized the frequent relation between the patient's mind and the patient's body. Accordingly, it is necessary that the physicians in this country should familiarize themselves with the medical and biological aspects of atomic energy so that not only may they understand the confused thoughts that are going through the minds of people today, but further, that they may assist in educating the laymen as to the medical and biological implications of atomic energy.

Certainly there is a great deal of confusion in the minds of the people as to just where we stand with atomic energy in peace or in war. I do not propose that physicians should assume responsibility for all public education in this field, but surely we have a responsibility in assuring that the people are correctly informed of the medical aspects of the problem.

With the war clouds darkening the horizon, people are becoming increasingly inquisitive as to these problems. This is not the time for any but clear, honest statements from physicians who have themselves been educated in the field.

DISCUSSION

COMDR. THOS. A. HARRIS, M. C., U. S. N. (Washington, D. C.).—It must be extremely gratifying to all of us in this audience today to hear of

the brilliant progress that has been made in solving some of the problems facing the medical profession in this, the atomic era. It is reassuring to hear of solid achievement in an area of hitherto speculative fantasy.

I am sure that I am not alone in this audience in noting the distressing lack of parallel advances in the psychiatry of atomic warfare. Perhaps my own experience with reference to the use of atomic weapons of war has left me with a greater sense of the urgency of the challenge to psychiatry raised by this latest weapon in armed conflict.

As a member of a Navy prisoner-of-war rescue mission I reached Nagasaki about a month after August 9, 1945. In the 2 weeks I spent there, I made several trips into the destroyed area, talked to Japanese civilians who were present at the time of the blast, and observed the manner and reaction of the people to that experience and to the arrival of the forces who had caused it. I may remind you that the terror occasioned by the bomb had by no means subsided in the intervening month. A great many deaths from the radiation effects were known to be occurring. People asked me, "Doctor, am I going to die?" As I walked along the streets of a protected portion of the city which was relatively undamaged I was followed by a group of 75 to 100 people. When I paused to examine the contents of one of the few shops open they crowded close about and reached out to touch me. At no time throughout this experience did I see a single gesture or hear a single sound of hostility. The damage remained untouched and nowhere was there any recognizable activity of repair or restoration. I gathered that the people were waiting for the dread weakness and the one-way trip to the hospital up on the hill.

The things I saw and heard made a profound impression on me then and have exerted a lasting influence on my thinking. I feel strongly that a frank and open discussion of the psychiatric implications of atomic warfare on the individual, on our social groupings, and on our government structure with reference to individual and mass reactions to the tremendous stresses involved is urgently needed.

While lacking any refined background knowledge of the Japanese personality or of their social structure, I have no doubt that the reaction of a great many of them took the form of so severe an apathy that they seemed completely unable to pick up the threads of commonplace life. Any coordination of these people in efforts to restore effective group action had become very difficult or impossible.

While there have been many influences that may have changed the picture in the United States since the days of the 1929 economic upheaval and of the "Man from Mars" broadcast, I presume that I am not alone in being tempted to indulge in hypothetical meanderings of an increasingly gloomy variety when I am thinking about mass psychological reactions to an attack with atomic missiles. It may be that our invidious, individualistic, materialistic emphasis on individual freedom and initiative, and low tolerance for thinking about mutual dependence and social responsibility is not a very reliable basis for undergoing the stresses inherent in atomic warfare.

These matters are of grave concern to the armed forces if only because of the overwhelming need for the effective integrity of the home areas—"our arsenal of democracy." It seems to me that possibly the most effective defense to the increasingly accelerated developments possible in an atomic attack of the future will be in the effectiveness and speed of group decisions and action—the handling of mass disorganization without delay—the moving of small groups under expert supervision. In short, leadership with a plan. It would appear, however, that social trends in this country are at present moving in the opposite direction.

The significant rôle of the psychiatrist in considering atomic warfare arises from his professional preoccupation with improving the capacities of the handicapped for dealing with the realities of the present and for exercising good foresight. The psychiatrist contemplating atomic warfare must concern himself first with formulating steps to minimize its devastating effects on personal effectiveness and capacity for participating in group undertakings; and secondly, in arresting the paralysis of initiative which is apt to come from fear of the later consequences of radiation effects. We like also to feel that psychiatrists may manifest useful foresight and that they will have opportunities for taking timely steps to prepare the civilian population in ways that would be useful in preventing wholly unnecessary demoralizing effects of widespread hysterical tendencies. The hysteric needs his hysteria, but effective group movement will minimize the contagious effect of his reaction.

It is my present view that a well-directed program of training of every citizen in the pertinent phases of national defense and of the formation of an organizational structure capable of withstanding the most destructive emergency is necessary, if only to silence effectively the prophets of disaster. Add to this the provision for swift-moving medical teams or highly organized and trained disaster groups with psychiatric components and a beginning has been made toward an effective civilian defense to atomic attack.

Those of us who were on board the ships under attack at Pearl Harbor were confronted with terribly impressive evidence that only thoroughly ingrained, well-disciplined team performances stood up at all in the face of such sudden, overwhelming destruction.

Any psychiatrist serving within the government cannot but be concerned at the extreme disproportion of interest in the biological as compared with the psychological scientific aspects of medicine. It would seem that the very threat we are discussing calls for the expenditure of large sums of money for research in psychiatry, for the training of psy-

chiatrists for these broader fields of usefulness, and for the training of psychiatric technicians who can augment the usefulness of the psychiatrist.

Of the many of you who are interested in these problems, the psychiatrists of the Naval Reserve met yesterday with the Surgeon General of the Navy. I would like to conclude my discussion with a quotation from the Admiral's remarks: "With particular reference to your specialty of psychiatry, I want to say that we are faced with a tremendous task in finding the right answers to such increasingly complex questions as the screening, selection, and conditioning of personnel to meet the demands of future armed conflict. On the one hand we have to deal with psychological stresses that are difficult to comprehend in their immensity, while on the other we see social forces which tend to impede the development of responsible and mature attitudes essential to meet these stresses. I am convinced that we will find a solution to this riddle, but the effectiveness of that solution will depend to a large measure on the willing and active cooperation and collaboration of organized psychiatry in meeting the challenge that this solution will present."

RECENT PROGRESS IN RESEARCH ON THE NEUROPHYSIOLOGIC BASIS OF MORPHINE ADDICTION[1]

ABRAHAM WIKLER, M. D., LEXINGTON, KY.

This paper was prepared with the dual purpose in mind of summarizing some of the experimental data acquired in recent years in the neurophysiological laboratory of the U. S. Public Health Service Hospital at Lexington, Kentucky, and integrating this information with clinical impressions derived from psychiatric studies of morphine addiction in man. Such a presentation aids in placing the results of investigations on animals with neurophysiological techniques in their proper perspective with regard to the understanding of psychiatric problems in man. Conversely, this method illustrates how some psychiatric problems can be investigated with advantage by means of neurophysiological techniques. In particular will be considered the effects of morphine[2] addiction on intact dogs with "experimental neurosis," on chronic decorticated dogs, and on chronic spinal dogs. Certain experiments with other drugs will also be described because of the bearing they have on the problem of morphine addiction.

INTACT DOGS

In a number of intact dogs, conditioned motor and respiratory differential responses were established by the "classical" Pavlovian technique in which the unconditional stimulus was a faradic shock to one hindleg; the unconditional responses were changes in respiratory rate and depth, phonation, flexion of the hindleg, or general escape reactions, singly or in combination; and the conditional stimuli were pure tones of 300 to 500 cycles per second, or a light signal. Differentiation of positive and negative conditional stimuli was pushed to and beyond the limits of the adaptive capacities of the animals, and further disturbing situations were introduced by exhibiting simultaneously a positive (light) and a negative (tone) conditional stimulus. Various adaptive patterns were exhibited by different animals, 3 of which were studied intensively for a period of over 2 years. Injections of morphine were given subcutaneously. The dose range was usually between 1.0 and 5.0 mg. per kg. in the nontolerant animal. During addiction, a level of 10.0 mg. per kg. twice daily was reached. Observations on conditional responses were made before and one to 1½ hours after injection.

In all animals, the usual immediate salivatory and emetic effects were followed by sedation as long as the animal was undisturbed. The effects on conditional responses, however, were more complex. Briefly, the effects of morphine on conditional responses depended on the stability of the latter, the effects on the unconditional response, and the personality of the dog as manifested by the general adaptive pattern which it exhibited most consistently under varying conditions over a long period of time. Thus if the conditional response was unstable, or if the dose of morphine was large enough to impair the unconditional response, the conditional response (and differentiation) was also impaired. In addition, however, morphine tended to accentuate that general adaptive pattern which was most predictable for any given animal. Thus "Dusty" usually exhibited an excitatory type of "neurotic" behavior when required to make difficult differentiations or when placed in a conflict situation. After persistent training, some differentiation could be established. In this animal, morphine consistently evoked a recrudescence of the excitatory "neurosis." Another dog, "Blackie," tended to exhibit an inhibitory type of "neurotic" behavior under similar conditions, and morphine usually enchanced the "neurosis." A very stable dog, "Gus," learned to make difficult differentiations readily without disturbance in gen-

[1] Read at the 104th annual meeting of The American Psychiatric Association, Washington, D. C., May 17-20, 1948.

From the Department of Research, U. S. Public Health Service Hospital, Lexington, Kentucky.

[2] The recently introduced analgesic "Methadon" was found to have effects qualitatively identical with those of morphine in intact, chronic spinal, and chronic decorticated dogs (1, 2, 3).

eral behavior. Attempts to induce "neurotic" behavior in this animal by subjecting it to a conflict situation were unsuccessful. In contrast to the other 2 dogs, morphine had little effect on the conditional responses of this animal. However, when, after 2 years of conditioning, an attempt was made to extinguish a very strong positive response, this dog developed an excitatory type of neurosis, with complete loss of differentiation. Morphine now had a marked effect, restoring the pre-"neurotic" behavior pattern with good differentiation.

During addiction periods of 83 to 158 days the most noteworthy change was a marked increase in irritability in all the animals. The particular form in which this was manifested varied from one animal to another, but was fairly constant for each dog. On some days it was necessary to discontinue testing in the conditional reflex chamber because the animal would struggle, bite the electrodes, chew the harness, etc. In all animals, profuse conditional salivation also developed. After abrupt withdrawal of morphine, the animals exhibited mild signs of abstinence similar to those described by Plant and Pierce(4), among which restlessness, tremors, vomiting, and slight fever were most prominent. After recovery the irritability manifested during addiction disappeared and tolerance to morphine was lost to a great extent. Otherwise the characteristic effects of morphine on each animal remained unchanged.

These observations can be applied to man only after certain limitations inherent in animal experimentation have been taken into consideration. In the first place, only overt behavior can be accurately observed and recorded in animals. Inferences regarding feeling tones accompanying such behavior are fraught with the danger of anthropomorphic projection. Secondly, in man it can be safely assumed that feeling tones accompany not only overt behavior but also action tendencies and phantasies. Furthermore, in man the feeling tones accompanying any given action tendency or phantasy are modified by their acceptability to the individual and are therefore closely related to the personality structure. Finally, the stressful situations in man which correspond to those which occur in discriminative conditional response experiments in animals arise in part from dynamic conflicts within the individual as well as in external situations.

With these considerations in mind, it may be inferred from our experiments that, in man, the effects of morphine on overt behavior, affect, and phantasies depend to a large extent on the personality organization of the individual and that the more firmly established reaction patterns in these spheres are more likely to be "released" by the drug, regardless of whether these are "normal" or "neurotic." The effects may differ markedly from person to person and perhaps in the same individual at different times. This is in accord with clinical experience. Thus in some highly narcissistic, egocentric individuals, morphine is apt to "release" phantasies of omnipotence and grandiosity with corresponding feeling tone of unusual well-being and overt behavior characterized by garrulity, boastfulness, and perhaps increased psychomotor activity, to which the term "euphoria" is applied. In other individuals, the effects may vary from mild depression to acute anxiety, or only a general sedative effect may be observed. However, insofar as habitual use of the drug is concerned, not only the effects, but also their meaning to the individual is important. Thus the "sedative" effect, when it occurs, may be unacceptable to the compulsive, but very attractive to the dependent person with a strong need to regress to a state resembling that of the satiated infant in which all wants are satisfied passively by taking something into the body. The effects of morphine may have many other meanings to different individuals. Ultimately the temptation to use the drug repeatedly will depend on the degree to which its effects satisfy strong emotional needs. Another factor is the strength of the personality defenses against gratification of such needs. This factor, in turn, is in part determined by the attitudes toward users of drugs that prevail in the social milieu of the individual. It is not surprising therefore that drug addicts constitute a heterogeneous group. Thus Kolb(5, 6) describes 6, and Felix(7) 4 classes of drug addicts based on descriptive criteria. From a dynamic standpoint, Reichard(8) stresses "tension" arising from a variety of somatic disorders or situational

problems as an etiologic factor in predisposing to addiction. Straus(9) and Rado(10) find that "tense depressions" frequently lead to experimentation with opiates. Simmel (11) regards intense oral and narcissistic cravings as dynamically important in opiate addiction. Clinical experience indicates that not only these factors but other dynamic mechanisms, such as the use of a forbidden drug to express hostility and by the same means to acquire an infantile dependent relationship, are operant in some individuals. Such specific psychodynamic factors cannot be investigated by animal experimentation. Our animal experiments indicate, however, that the personality type is important in explaining the effects of morphine, and must be studied intensively in man.

Another finding in our animal experiments which may have clinical significance is that morphine did not affect differentiation of stable conditional stimuli unless the unconditioned response was impaired, or the general adaptive pattern was altered by the drug. This suggests that, in man, morphine does not impair intellectual functioning *per se*, but may do so by its effect on motivation or on emotional attitudes to the problems at hand. This must be borne in mind in evaluating results of studies on work or test performances of patients during experimental addiction studies in institutions, where motivations and emotional attitudes toward persons may be quite different from those in life outside. For example, motivations derived from the sex drive are probably impaired markedly in opiate users since most addicts find that morphine diminishes or abolishes their sexual desires and renders them impotent. Such effects frequently have resulted in divorces and broken homes and have also, no doubt, manifested themselves in less obvious ways in other interpersonal relationships. The effects may be quite different in the case of a basically mature, well-adjusted individual whose performance is impaired by a painful illness or an emotional disturbance of a temporary nature. Here morphine, by alleviating these disturbing factors, may "release" the patient's capabilities and improve performance. The reverse may be expected to occur in an individual whose personality organization is basically more infantile but who is making an adjustment at a more mature level with difficulty. Such a person would more likely "regress" to an earlier level of psychosexual development. Such inferences appear to be borne out by clinical experience.

The clinical significance of some of the observations on intact dogs during morphine addiction will be discussed in connection with the studies on decorticated and spinal dogs.

Chronic Decorticated Dogs

The effects of morphine were studied in 13 chronic decorticated dogs, which were prepared by aseptic removal of each cerebral hemisphere in 2 operations a month or more apart. After hemostasis was secured by the use of electrocautery and silver clips, attempts were made to remove all accessible neocortex by suction. The longest period of survival was 19 months after completion of decortication. After death of the preparations, the remaining brains were fixed *in situ* and removed for gross and microscopic study. Of the first 11 specimens, the removal of neocortex was found to be complete in 5; in the others, small bits of occipital or temporal cortex were preserved. In the last 2 specimens, gross examination disclosed no remaining neocortex. Microscopic studies have not yet been completed. In all preparations, in addition to neocortex, various portions of the caudate, thalamus, hippocampus, pyriform lobes, and olfactory tubercles were also removed, and the olfactory tracts transected. The anterior limit of the transection was about 5 mm. anterior to the optic chiasm.

In 6 of the preparations it was possible to make studies during complete cycles of morphine addiction. Three of these were addicted before decortication. In the other 3, addiction studies were not begun for a month or more after the final operation, thus permitting adequate control studies. The morphine withdrawal syndrome was essentially the same in both groups, but for present purposes the data obtained on the group addicted after decortication will be presented.

These preparations exhibited behavior characteristic of chronic decorticated dogs. The tactile placing reactions were absent and hopping reactions impaired or abolished. When scratched on the back they exhibited vigorous licking and chewing movements.

They exhibited an orienting reflex to noises consisting of widening of the palpebral fissures and wagging the head from side to side. In response to sudden high-pitched noises, a startle response was exhibited, the animal springing to its feet. Sudden tactile stimuli (*e.g.*, grasping the back), painful stimuli, or restraint evoked the classical picture of "sham rage." When placed in a corner, the preparations would push forward obstinately with their heads. When extricated they tended to walk about in circles or lie down. They swallowed food placed in the pharynx and ate if the snout was thrust into the food bowl. However, they were unable to find food placed near them. Because several preparations were lost by aspiration of liquid vomitus, fluids were administered only in the form of daily subcutaneous injections of 300 to 400 cc. of normal saline. The longest surviving animals showed evidence of partial adaption in that they avoided the walls of the circular pens in which they were kept, backed away from obstacles in their path, and one was frequently found with its forepaws on the rim of the pen wall, as if attempting to climb over it. On the other hand, none of the preparations showed the slightest sign of recognition of the saline clysis apparatus, even though this procedure always evoked furious excitement. None of these animals showed evidence of recognition of the special box in which they were always fed. One preparation, in which a parotid salivary fistula had been prepared, salivated whenever picked up if it had not yet been fed that day. The response could not be extinguished by repeated handling not followed by feeding. The results of formal attempts at conditioning will be described below. In addition to observations on the reactions already described, studies were also made on the tooth-pain reaction threshold by stimulating a cuspid tooth with 60-cycle A. C. applied with a bipolar electrode to 2 silver amalgam fillings placed down to the dentyne on opposite sides of the tooth. This threshold, a twitch of the lower lip followed by withdrawal of the head, was found to be essentially the same as in intact dogs.

In these preparations, subcutaneous injections of 2 to 10 mg. per kg. of morphine were followed within 3 to 5 minutes by salivation and emesis, attended by some motor restlessness lasting about 5 to 10 minutes following which spontaneous activity was profoundly depressed. "Sham rage" in response to all stimuli was reduced or abolished. The tooth-pain reaction threshold was elevated. The animal frequently exhibited extensor rigidity of the forelegs even in the lateral posture. The orienting and startle responses remained or were even exaggerated after small doses, but were abolished by doses of over 10 mg. per kg. Body temperature was lowered, respirations were variably affected, and pulse rates were slowed.

During addiction, tolerance developed in varying degrees to each of the effects noted above, even at dose levels of 25 mg. per kg. every 6 hours. This was especially marked with reference to the depressant effects of morphine on "sham rage" and tooth-pain threshold reactions. Indeed the preparations became increasingly irritable as addiction progressed, so that attempts to measure pain reaction thresholds during the latter part of the addiction periods had to be abandoned because of the ferocity of the animals. As the preparation became tolerant to each new dose level, it exhibited motor restlessness and increased irritability during the hour preceding each regular dose of morphine. A striking finding was the absence of any gross evidence of conditioned salivation, which is so prominent a feature of addiction in intact dogs. More detailed data on salivation during morphine addiction in decorticated dogs are given below.

On abrupt withdrawal of morphine after a period of addiction lasting from one to 4 months with final dose levels varying from 10 to 25 mg. per kg. every 6 hours, the preparations exhibited a well-marked, fairly stereotyped abstinence syndrome which can be divided into 5 stages of varying duration, viz.: (1) an initial stage of restlessness and irritability which is a continuation of the usual pre-injection behavior; (2) quiescence but further increase in irritability, during which yawning, rhinorrhea, salivation, fever, vomiting, and peculiar postures appear; (3) a second period of restlessness (circling in the pens in which the animals are kept) during which irritability steadily diminishes; (4) sniffing, rooting, and gnawing at the

floor of the tub, usually in corners, associated with almost complete absence of "sham rage" responses; (5) gradual cessation of such behavior with return to posture and activity similar to that before addiction. During stages (2) to (4) inclusive, a single injection of morphine abolished the abstinence signs, increased irritability and restored the animal's posture and behavior to a more "normal" level—effects directly opposite to those exerted by the same dose before addiction, and after loss of tolerance following recovery from the period.

Because of their importance in the theoretical interpretation of the results, intensive studies were made on conditioning of these preparations, particularly the 2 longest surviving ones. The unconditional stimulus utilized was faradic shock applied to one hindleg, and the unconditional response was flexion of the leg, mild escape movements, and barking. After over 1,000 combinations of a pure tone for 5 seconds followed by shock, no sign of conditioning appeared. Another 1,000 trials were made of combinations of tone for 10 seconds, during the last 5 seconds of which the grid on which the dog's leg rested became charged. The charging (faradic current) was accompanied by a loud buzzer noise and the dog could avoid the shock by raising the left leg off the grid. No sign of avoidance appeared; the dog merely raised and lowered his leg back onto the grid after each shock thereby sustained. In other experiments, tactile conditional stimuli were used. The procedure consisted of applying 10 successive light strokes to the lower back with a plastic comb, followed immediately by faradic shock to a hindleg. After 604 trials in one and 471 in another chronic decorticated dog, discreet conditional flexion responses appeared which remained stable over a period of several days. By omission of the shock, the conditional response was rapidly extinguished, and after reinforcement, restored. An interesting feature of these studies was extinction of the orienting reflex after the first few trials in each conditioning session, with reappearance of the phenomenon at each successive session. Attempts were made to produce time conditioning by regular excitation of the preparations for 20 minutes every 6 hours during a 3-month period with a wire brush charged with faradic current. A general increase in motor activity occurred, but this bore no predictable time relation to the periods of stimulation. Formal attempts to produce conditional morphine salivation were made in the 2 longest surviving dogs, after full recovery from other addiction experiments. Subcutaneous injections of morphine, 5 mg. per kg., were given once daily in the morning (feeding in the afternoon) after the animal had been placed in a harness in a quiet room for 15 minutes. Occasionally a subcutaneous injection of physiological saline solution was given instead of morphine, the latter being injected after completion of observations for evidence of conditional salivation. In an intact normal control dog, definite evidence of conditional salivation appeared on the third day and rapidly became very profuse, long ropy strands of saliva hanging from mouth and a pool of saliva forming on the table below a few minutes after being placed in the harness. In one of the chronic decorticated dogs, salivation appeared neither before nor after morphine during a one-month period. In the other preparation, salivation did follow morphine injection but there was no salivation before, or following a saline injection during a period of 41 days, except when pre-injection irritability was very marked, as happened frequently during the latter part of this period. At such times, quieting the animal by raising it with the harness so that the toes were lifted off the table, resulted in cessation of salivation; nor did it appear then if saline was injected. Further evidence that salivation under such conditions was an accompaniment of general excitement, was obtained by exciting the animal in its tub with a wire brush charged with faradic current. When the sham rage reaction appeared, salivation of the same degree of magnitude as that seen in the conditional reflex room was observed.

From these studies, it may be concluded that these chronic decorticated animals were capable of some degree of adaptation but, except for tactile conditional responses (which were difficult to induce), the animals were unable to differentiate significant from non-significant stimuli, and their responses were characterized by diffuse excitation.

Since the morphine abstinence syndrome in decorticated dogs so closely resembles that of man, and since the capacity for acquiring conditional responses is so limited in the decorticated preparation, it appears justifiable to conclude that, irrespective of meaningful factors in the genesis of the withdrawal syndrome, the essential features of the latter are due to changes in the organism which are in part independent of symbolic significance. These changes involve both the somatic and the autonomic portions of the central nervous system, and perhaps nonneural structures as well. The rapid abatement of abstinence signs by injection of morphine with partial or complete restoration of the animal to its prewithdrawal condition justifies the view that during physical dependence there is a biological need for the drug, similar to the need of the organism for food, water, salts, etc., which in man is experienced subjectively as a craving for opiates. By analogy with other biologically determined "cravings" one may infer that in mild degree, and especially with gratification in prospect, such experiences are definitely pleasurable, and the actual gratification of this need is intensely pleasurable. This type of experience, added to the pleasurable effects derived from the primary effects of morphine, may contribute greatly not only to keeping the addict on opiates, but also in motivating him to relapse after a variable period of abstention from the drug. Of course, prolonged abstinence from opiates during addiction is intensely disagreeable, just as are protracted hunger or thirst; yet we know from clinical experience that the discomforts of withdrawal rarely, if ever, deter the addict from relapse. One important difference between the artificially induced biological need for morphine and such natural needs as food and water is the fact that the morphine abstinence syndrome is self-limited. Although the procedure may be quite uncomfortable, the average addict could be expected to withdraw the morphine himself by rapid reduction, without danger to life or suffering more intense than that which he has often experienced when ill with upper respiratory infections. That he does not withdraw himself indicates that fear of abstinence discomforts alone is not the most important factor in maintaining his addiction. One should seek it rather in the reluctance to give up the pleasurable effects of the drug and the satisfactions derived from satisfying cravings related to mild abstinence changes. This reluctance in turn can be understood only with reference to the personality organization of the individual.

The unpleasant aspects of physical dependence may also contribute to the motivation for relapse. The efficacy of morphine in relieving the anxiety associated with severe withdrawal changes may lead to the use of the drug to relieve anxiety arising from other sources, *e.g.*, neurotic conflicts within the individual. Lindesmith(12) believes that the principal motivation to relapse and permanent "addiction" is the discovery by the person who is physically dependent on morphine that this drug will relieve withdrawal symptoms; he is then inclined to try the drug for relief of other physical discomforts. While such factors may contribute to the complex motivations for relapse, the pleasurable aspects of opiate addiction and the personality organization of the individual are of greater importance.

Chronic Spinal Dogs

Chronic spinal dogs were prepared by transection or removal of a small segment of spinal cord between the tenth and twelfth thoracic segments under aseptic conditions. With special care such preparations have survived for as long as $3\frac{1}{2}$ years. After the first few weeks the animal has fully recovered from spinal shock, the bladder has become efficiently automatic, skin ulcers have healed and the hindlimb reflexes have become fairly stabilized. Most of our experiments were made on dogs not earlier than one month after preparation. Subcutaneous injection of morphine in doses of 2.0 to 25.0 mg. per kg. was regularly followed by depression of the flexor, crossed extensor, mark-time, and Philippson's reflexes. The ipsilateral extensor thrust was usually enhanced, while the knee jerks were little altered, and in either direction. During addiction, tolerance to the depressant effects developed even to doses of 25 mg. per kg. every 6 hours. On abrupt withdrawal, a well-marked abstinence syndrome developed

both above and below the level of transection. That above consisted of signs observed in intact dogs during morphine withdrawal—rhinorrhea, salivation, mydriasis, fever, tremors, and restlessness. Below the level of transection, marked hyperactivity of the flexor and crossed extensor reflexes appeared and, later, rhythmic movements of the lower extremities which obscured all reflexes except the ipsilateral flexor. When it was possible to test the ipsilateral extensor thrust and the knee jerk, these reflexes were found to be markedly reduced during the withdrawal period. These hindlimb abstinence changes reached a peak somewhat later than those above the level of transection and subsided much more slowly. A striking observation in some of the preparations during the withdrawal period was the appearance of marked muscle tremors which appeared at different times above and below the level of transection. During the withdrawal period, morphine restored the preparation to its prewithdrawal status.

Changes very similar to those appearing during the morphine withdrawal period were observed on subcutaneous injection of eserine, 0.25 mg. per kg. Rhythmic running movements appeared in the hindlimbs, as well as muscle tremors, salivation, fever, mydriasis, and restlessness. These were abolished by subcutaneous injection of morphine, 10 mg. per kg. These observations are of interest in connection with the anticholinesterasic effects of morphine(13). They suggest that the morphine abstinence changes may be related to cumulative depression of cholinesterase, the effects of which become manifest only in the absence of the narcotic action of morphine, which itself is independent of its action on cholinesterase. Further studies are in progress to elucidate the role of acetylcholine in the morphine abstinence syndrome.

Interrelation of "Physical" and "Psychic" Dependence

We have further to consider the neurophysiological aspects of morphine addiction which are related to symbolic factors of various degrees of complexity, implied in the clinical term "psychic dependence." Such factors play an important rôle in the modification of the morphine abstinence syndrome as well as in the motivation for relapse. The psychoanalytic literature(10, 11) has dealt with such aspects as the rôle of the abstinence syndrome in satisfying the need for punishment. The intensification of the morphine abstinence syndrome by anxiety generated by the prospect of giving up the drug is well known to all who have treated opiate addicts(14).

Another process involving symbolism at a simpler level may be that of conditioning of drug effects which are in themselves unconditional in a manner analogous to conditioning of unconditional responses to food, painful stimuli, etc. If in the case of morphine we define "drug effects" as the changes which are observed after injection of the opiate, this term applies to the depressive effects in nontolerant individuals and to the excitatory effects (manifested during withdrawal) in the tolerant subject. *A priori* it may be expected that some components can become conditioned in either case. A more detailed postulation which would lead to experimental verification must be delayed, however, until the general problem of pharmacological conditioning is further clarified.

It is well known that not all drug effects can be conditioned. Thus Gantt(15) reported inability to condition the hyperglycemic effects of adrenalin; Finch(16) was unable to produce conditional salivation to pilocarpine; Katzenelbogen *et al.*(17) could not produce conditional secretion of gastric juice to histamine. It would seem, however, that by analogy with classical types of conditional reflexes not the direct effects of the drugs but the adaptive responses to them would be conditioned. Thus in Pavlovian conditioning of salivation to food, it is not the direct effects of food (gustatory and olfactory sensations evoked by the presence of food in the mouth) but the adaptive response to these afferent impulses, namely, salivation which is conditioned. Similarly, in the motor conditional response, it is not the direct effects of faradic shock to the skin (pain sensations) which are conditioned but the adaptive response to them, namely, withdrawal of the part. Therefore, in the investigations referred to above, perhaps the opposite of the direct effects of the drugs used

TABLE 1

CONDITIONAL RESPONSE CONCEPT OF INTERRELATION OF "PHYSICAL" AND "PSYCHIC" DEPENDENCE IN MORPHINE ADDICTION

Agent	Unconditional stimulus (U.S.)	Unconditional response (U.R.) (Mainly subcortical)	Subjective concomitant * (U.R.)	Agent	Conditional stimulus (C.S.)	Conditional response (C.R.) (Mainly cortical)	Subjective concomitant * (C.R.)
Food.	Taste and smell of food.	Salivation.	Hunger.	Bell.	Meaning of sound.	Salivation.	Hunger with craving for specific food used in experiments.
Electric Shock.	Pain.	Defence reactions.	Fear or rage.	Bell.	Meaning of sound.	Defence reactions.	Fear or rage directed toward electric shock.
Atropine (drug acting peripherally).	Dryness of the mouth.	Salivation.	Thirst (?)	Injection.	Meaning of injections.	Salivation.	Thirst with aversion to atropine.
Apomorphine or morphine (in dogs) (drug acting centrally).	(By-passed).	Vomiting.	Nausea.	Injection.	Meaning of injections.	Vomiting.	Nausea with aversion to apomorphine or morphine.
Morphine (in dogs).	Direct central emetic effects.	Salivation.	Nausea.	Injection.	Meaning of injections.	Salivation.	Nausea with aversion to morphine.
Morphine in nontolerant subject.	(By-passed).	Direct central effects of morphine.	Sedation.	Injection.	Meaning of injections.	Direct effects of morphine.	Sedation, etc., with liking for, or dislike of morphine.
Morphine in tolerant subjects.†	Direct central effects of morphine.	Abstinence changes.†	Anxiety.‡	Injection.	Meaning of injections.	Abstinence changes.†	Anxiety with craving for morphine.

* The subjective concomitants may or may not be at a conscious level. The degree of specificity of the subjective concomitant of the conditional response is related to the capacity for symbolization of the species studied.

† The abstinence changes are presumptively related directly to the dosage and degree of tolerance established. After withdrawal of morphine, tolerance disappears rapidly in animals but clinical experience indicates that it persists to a significant degree in man for at least many months. The propensity of addicts to relapse may therefore be due in part to mild conditional abstinence changes, expressed as anxiety with craving for morphine, which are evoked by appropriate meaningful situations.

‡ Anxiety due to abstinence changes and its relief by morphine is of great importance in establishing a habit pattern of relieving anxiety due to other factors (*e. g.*, neurotic conflicts) by the use of morphine and similar drugs.

should have been expected in response to the conditional stimuli.

There is some evidence in the literature to support such a hypothesis. Thus in attempting to produce conditional hyperglycemia during daily injections of adrenalin, Gantt(15) noted that the blood sugar often fell after a test injection of normal saline. Brogden and Gantt(18), while studying intraneural conditioning, noted that the conditional response was often different from, and once the exact opposite of, the unconditional response. Kun and Horvath(19) reported a hypoglycemic response to oral administration of saccharin. Mulinos(20) reported conditional salivation during daily administration of atropine. Crisler(21) was unable to confirm this, but Finch(22) adduced evidence of conditional salivation to atropine.

In our laboratory, studies on conditional salivation during daily administration of atropine to dogs and cats were made as a test of the hypothesis discussed above, before the work of Mulinos and Finch came to our attention. Definite evidence of conditional salivation was found in both dogs and cats, although the stability of the response varied widely from one animal to another, and there appeared to be a critical dose level for each (0.15 to 5.0 mg. per kg. in the dogs and 5.0 mg. per kg. in the cats). The findings are therefore in agreement with that of Mulinos. However, the latter(23) attributes this phenomenon to conditioning of a central salivatory-stimulating action of atropine opposed to the peripheral salivary-depressant action of the drug. However, the evidence agrees equally well with the view that conditional salivation during daily injection of atropine is due to conditioning of an adaptive response to drying of the mouth produced by the direct effects of the drug on the salivary glands.

Further studies are now in progress to test these alternative explanations, particularly with reference to possible differences in conditioning mechanisms operating in

drugs which act centrally and those which act peripherally.

With the evidence thus far available, no final application of these findings to the problem of morphine addiction can be made at present. However, a tentative formulation which may be of value in further research is illustrated in Table 1. Although the essential features of this concept would remain the same if the abstinence signs are regarded as direct stimulant effects of morphine(24), the view here utilized is that unconditional tolerance and physical dependence (as observed in the decorticated dog) are due to physiologic changes which are in the nature of adaptive responses to the direct depressant effects of the drug. This is similar to the "stress and strain" hypothesis of Himmelsbach(25). In the intact animal or man, this unconditional response may become conditioned to various situations or memories associated with taking the drug, thereby evoking subjective experiences similar to those associated with morphine withdrawal, namely, anxiety with craving for the drug. As in classical conditioning, the intensity of the conditional abstinence changes would depend on the intensity of the unconditional response, namely, the extent to which the physiological changes occurring during morphine withdrawal are still present. That these may persist for a long time is indicated by Himmelsbach's studies(26) which show that physical recovery requires not less than 6 months of total abstinence from opiate drugs. Also, in our experience, many post-addicts show very few effects after taking 30 mg. of morphine intravenously even though they have been abstinent for many months. Although conditioning on the basis described can be only one of many factors predisposing to relapse, it may be of considerable importance especially during the first few months after completion of a withdrawal treatment.

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A REPORT OF SPONTANEOUS RECOVERY IN TWO CASES OF ADVANCED SCHIZOPHRENIC ORGANISMIC STAGNATION

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This report concerns itself with the clinical course of two so-called "deeply regressed" schizophrenic patients together with a discussion of certain relationships which, in the author's opinion, may be deduced therefrom. The reader will note that the expression: *"organismic stagnation,"* is substituted for the current official psychiatric term, deeply regressed. The reasons for this choice of terminology will be discussed later.

Both patients herein presented finally recovered from their psychosis after many years of care at the Binghamton State Hospital. Neither of the two patients had any special care or treatment which differed from that received by hundreds of similarly diagnosed patients on the continued treatment wards of the hospital who seldom make much improvement, not to mention recovery. It is highly improbable that any psychiatrist who might have occasion to examine these two cases within 5 years after their certification to the hospital would have ventured anything but the very worst prognosis.

The first patient, a white married female, was admitted at the age of 29 years, and spent 6½ years on the continued treatment wards of the hospital. The second, a white married male, was 36 years old on admission, and spent 10 years and 2 months on the continued treatment wards. The degree of so-called regression or organismic stagnation was no different from that observed in thousands of other continued treatment schizophrenics who never recover, who remain in psychiatric hospitals for the balance of their lives, and who constitute that 58% of patients who fill the permanent treatment mental hospitals of the United States.

The first case, a registered nurse, has been out of the hospital for 12 years. During that period of time she has not only managed her household efficiently but has also occupied herself gainfully as a private duty and general hospital nurse. Her husband, a chemist, claims that he has never known her to be in a better state of mental health. The second case, a former railroad switchman, has once more resumed gainful employment with his company as a switch tender and has a promise of re-instatement in his former grade of switchman if he can handle his present job efficiently for a period of one year. He has been out of the hospital for over 2 years after a supposedly hopeless state of organismic stagnation. He has once more taken up the domestic and occupational threads, broken 10 years ago by a schizophrenic psychosis, against very considerable odds and prejudices described in an abstract of the case record.

Many things have been written in psychiatric literature about recoveries initiated by this or that person's method of treatment. Little is heard about patients who get well by virtue of their own biological capacities. In the author's opinion these two cases afford much food for broad, constructive, psychiatric deliberation. One wonders, too, what is wrong with our present thought on the nature of schizophrenia, its methods of treatment, and much else which seem incapable of rehabilitating the profoundly stagnated types who fill the continued treatment wards of every mental hospital. That such rehabilitation is possible would appear indicated by the clinical course of our two schizophrenic patients.

Off-hand the author can think of at least 4 attitudes which operate against the rehabilitation of stagnated schizophrenics. Firstly, the patient is a schizophrenic and does not wish to pry himself loose from his autistic world of regression and psychosexual fixation. This notion falsely implies that one is dealing with an organism that *wills* to be autistic and withdrawn rather than a sick one who cannot help itself. Secondly, the fact that a patient has been labelled "schizophrenia," *pari passu*, implies poor chances for rehabilitation according to the dogmatic and therapeutically unimaginative pronouncements of certain "authorities." Thirdly, a curious un-

warranted tendency to place the blame for therapeutic failure on the patient rather than on our own ignorance, where the blame rightfully belongs. Fourthly, too much focus is directed upon the interesting and fascinating elaborations of the schizophrenic psyche (and this goes hand in hand with relatively inconsequential psychopathological interpretations of mere symptoms) and not enough upon the schizophrenic organism with its variable manifestations of functional dysequilibrium, the schizo-physiology, whose basis is doubtless biochemical and in the last analysis probably attributable to a disturbance in the bioelectrochemical harmony of intracellular relationships.

The author prefers to use the term "organismic stagnation," a variable as to degree, instead of "regression" to describe the clinical condition of the 2 patients herein described. "Organismic stagnation," in his opinion, is a good descriptive term for the clinically obvious state of general functional dysequilibrium and associated biochemical stagnation prevailing in advanced cases of schizophrenia. It presumes to say nothing about actual and ultimate causality. It does not claim that symptoms are causes. In the author's experience, however, it does seem to favor a more flexible and hopeful mental attitude toward the constructive rehabilitation of these particular types of mental patients.

The term "regression," on the other hand, is derived from psychoanalytic theory. It is dogmatically circumscript and limited precisely to psychosexual adaptation. It completely ignores, from the therapeutic angle, the broader and variable biological, biochemical, and organismic aspects of the problem. There certainly exists a disturbance of function which in the last analysis is biochemical whether it be released by internal or external factors or a combination of both. And biochemistry has become synonymous with bioelectrochemistry.

In biology, adaptation refers to modification of an animal or plant (or its parts or organs) fitting it more perfectly for existence under the conditions of its environment. It is indeed difficult to imagine how our 2 schizophrenic patients were modified to fit themselves more perfectly for existence under the conditions of their environment. Adaptation implies something which has constructive biological value to the organism. There was nothing observed in our two cases which confirms the psychoanalytic notion of regression through successive phases: back to adolescence, puberty, childhood, infancy, or the intrauterine life. Nothing, which in their totality might be analogous to or even resemble in the remotest sense the state of healthy infancy, unless one refers to helplessness. Schizophrenic patients do occasionally claim that "their mind goes way back to childhood events." That does not mean that they once more become children or infants.

Ignored completely, by some observers, is the fact that the human organism can be so altered by continuous administration of sublethal doses of various chemical substances until a point is reached where symptoms of physiological disturbance appear in the form of behavior disorder, personality change, emotional disturbance, psychosexual peculiarities, hallucinations, delusions, and much else which in many ways resemble symptoms conforming with the usual notion of regression. The symptoms produced by such sublethal doses of chemicals will depend, in part, upon the specific nature and individuality of the organism subjected to them; in part, upon the pharmacological character of the chemical, its concentration, and the interval of time during which it is administered. The attention of the reader is called to the different mental reactions observed in chronic alcoholism. Maier(1) has described similar reactions in cocainism. DeJong(2), with a varied assortment of chemicals, has produced symptoms of so-called schizophrenic "regression" in animals. Human experiments with proper doses of hyoscyamus and stramonium indicate that mental symptoms can be released, in susceptible individuals, which are almost identical with manifestations seen in many excited schizophrenics(3). In his excellent book, *Foundations of Neuropsychiatry*, Cobb(4) says:

> Like all substances injurious to the nervous system (viruses, bacterial toxins, metabolic toxins, and drugs), different forms of lead seem to attack different parts of the nervous system. Metallic lead and the oxides have a predilection in adults for the more distal muscles and nerves of the extremities, whereas tetraethyl lead attacks the cere-

bral cortex. In children ingested lead almost invariably causes an encephalopathy rather than a neuritis. What causes these specific vulnerabilities of certain tissues to certain poisons is unknown. Much has been written on the subject, especially by Oskar Vogt, who uses the term "pathoklisis" for the local susceptivity of certain parts of the nervous system to certain poisons and believes that it is due to "chemical affinity." Whatever the cause, it is a most remarkable phenomenon, and conspicuous examples are common: thallium and methyl alcohol especially affect the optic nerve; the triorthocresol phosphate of "jake" paralysis and of "Apiol" effect almost exclusively the peripheral motor nerves; carbon bisulphide chooses the sensory nerves of the hands and feet; while trichlorethylene picks out the sensory part of the trigeminal nerve.

In his monograph on the concept of "pathoklisis," Oskar Vogt(5), attempting to explain topical diseases of the nervous system based on his theory of pathoklisis (*pathos,* disease + *klisis,* inclination) said:

> We believe that the cause of these topical diseases is due to an enhanced vulnerability of the tissue which is subject to the disease process. The vulnerability exists in the internal structure and, in the last analysis, is due to the specific physicochemical nature of the diseased tissue elements. This vulnerability, alone, is called "pathoklisis." . . . . Wherever we had opportunity to investigate the physiological significance of architectonic differences between nervous parenchyma, they have proven to be morphological expressions of physiological and, hence, physico-chemical differences. Thus, we arrived at the conclusion that the specific vulnerability, prevailing in topical somatic diseases, can be traced to a specific physicochemical nature of the potentially morbid tissue elements. . . . . If the different pathoklisis of the various topical units is based upon unlike physico-chemical nature, the pathoklises, as such, point directly to such differences. These indications must be the first halting-place on the pathway toward chemotherapeutic influence upon the disturbed physico-chemistry of the individual topical unit. The future treatment of mental illness will depend on the prospects of chemotherapy. Humanity will not be receptive, for a very long time, to the idea of propagating according to the principles of eugenics, and thus eliminate the hereditary disposition to nervous disease. . . . . Therefore, we physicians will have to combat hereditary dispositions, therapeutically and prophylactically, for a long time. But our most important weapon in this struggle, as stated, will someday be chemotherapy. And so, the "pathoklises" and the discovery of their physico-chemical foundations will form a very important starting-point for this most valuable therapy of the future.

Now, as a matter of fact, the principle of pathoklisis is valid not only for organs and systems but also for the organism as a whole. Research workers have not taken the trouble to investigate the *therapeutic potentialities* of the pathoklitic action of drugs in chemically reversible disorders, or before they become chemically irreversible. It follows certain very precise principles. Insulin shock and electroshock are only the beginning of the biochemical possibilities of treatment in schizophrenia.

As to sexual frustration: this is unquestionably an aggravating and contributory factor in many cases(6). In the author's clinical experience, however, the satisfaction of oral-erotic, incestuous, or homosexual drives, either in reality or symbolically, and on a nonpsychotic level, does not prevent the development of schizophrenia. The simple type of schizophrenia also indicates that the pathognomonics of this illness has broader scope than merely the psychosexual aspect of the organism.

When our Case I develops a schizophrenic psychosis in connection with biochemical changes initiated in the organism coincidental with a strict reducing regimen, intemperate use of sedative drugs (bromides, barbiturates, and narcotics), and a loss in one month of 50 pounds; and Case II develops a similar psychosis in connection with biochemical changes initiated in the organism coincidental with a series of "toxin" treatments for hay fever, it does not seem reasonable to assume that sexual frustration, regression, fixation, or wish fulfillment could have *exclusive* pathognomonic significance—even if thoughts can release biochemical changes in the organism. Similar schizophrenic reactions, in a properly susceptible potentially schizophrenic organism, can be released in relation to infectious diseases, operation for toxic goitre, pregnancy and postpartum states (with or without rejection mechanisms), undue stress of all kinds, etc. The essence of the problem is not just sexual frustration with associated regression and fixation (these may occur in anyone under proper conditions), but rather the existence of a variable and potential schizophrenic organism prior to the releasing or trigger incident.

Considering the variability of the human organism, in general, the innumerable variations of symptomatic pictures, I cannot resist

the temptation of acquainting the reader with a choice passage written by Dr. J. G. Rademacher(7) back in 1841:

Whoever, in the fifth or sixth year of practice, does not begin to appreciate that all textbooks on pathology and therapeutics are nothing but clumsy shadows of the unfathomable, indescribable, and protean disease pictures of nature may become a very learned doctor or professor of medicine, but, as a master of the art of healing, he will never amount to much, because he lacks healthy vision and plain common sense. Not many years ago, I had a good friend who was also a good accountant. While playing a small church organ, he was suddenly seized with an impulse to calculate how many variations of tone could be produced by pulling out the different registers. The result of his calculation was that the possible tone variations ran into several thousands. Since my friend showed me the results of his endeavors and since I, a simple practitioner, related everything to my profession, I asked him, "Dear Friend, your organ is indeed very small; its register is very limited, and yet you are able to produce such a large variety of tones on this instrument of wood and lead. How many registers exist in the human organism (we hardly know them all), and how many alterations can nature produce in this earthly and spiritual instrument? Where is the accountant who can calculate all of them? He has yet to be born. In fact, he will never be born."

We will now proceed with an abstract of the official case records of the two schizophrenic patients who were mentioned above.

CASE 1.—Id. No. 208294. Admitted to the Binghamton State Hospital on October 14, 1929. Diagnosis: Schizophrenia, hebephrenic type. Age 29, white, married female. A registered nurse.

F. H.—Inadequate.

P. H.—The eldest of 9 children. Somewhat slow to walk and talk. Had the usual childhood diseases. After completing high school and training school, was certified as a registered nurse. In 1923 she married a widower with several children. Marriage was not regarded as entirely satisfactory (this information was not given or confirmed by either the patient or her husband). Patient bore no children of her own. She is inclined to be frigid. For sometime prior to admission, it was necessary for the patient to nurse her psychotic mother-in-law; this was not too palatable.

Personality Make-Up.—Ambitious and practical; had lots of girl friends but few of the opposite sex. Oversensitive, touchy, fairly sociable, even tempered, and always agreeable. She was lively, intelligent, and an excellent housekeeper. Besides nursing interests, liked sewing and knitting.

Onset of Psychosis.—During February 1929, the patient became concerned about her obesity and went on a strict reducing diet, losing 50 pounds in 30 days. She became restless. When her husband (a chemist) missed some drugs he had in the house, his suspicions were aroused. He discovered that the patient was taking large doses of bromides, barbiturates, and also narcotics. When the drugs were removed, the patient became suspicious, refused to talk readily, and became indifferent in the care of her home and her personal appearance. In May of 1929, she took a dose of copper arsenate which her husband had on hand for experimental purposes. An antidote was given and there were no untoward effects. In August, 1929, she was admitted to a private mental hospital for a period of two weeks. While there she developed a delusion that she was suffering from syphilis; showed evidence of auditory hallucinations, and thought people were talking about her. She then was discharged to her family under the care of a nurse. She believed her family and friends were against her. Admitted she was unhappy and wanted to kill herself. No improvement occurred, so she was certified to the Binghamton State Hospital.

On Admission.—She appeared fearful and refused to answer questions. Spontaneously said: "I don't want to stay." Objected to going on the ward and resisted initial attention. At no time was she cooperative. She became steadily more untidy in her personal appearance and filthy in her habits. Masturbated openly. She took no interest in ward activities. Affect was unnatural and the facial expression, blank. Continually picked at her face and arms. Displayed involuntary laughing. Wet and soiled. Nothing could be obtained about the mental content.

Physical Examination.—Ht.: 5 ft. 7¼ in. Wt.: 154½ lbs. (usual weight 194 lbs.) Well developed and nourished, sallow complexion. Thyroid slightly enlarged. Neurological, gynecological, serological, and urine examinations, negative.

Subsequent Course.—On one occasion the patient admitted that she took 100 grains of bromides daily for "nervousness" following a reducing regimen. She became progressively more untidy in her habits so that many patients on the ward complained. There were long intervals when she would tear up her clothes. For a period of 5 years the patient's condition remained essentially as described above. There were two unsuccessful suicidal attempts: once by drowning, and again by chloroform inhalation. During December 1934, she began to show some improvement, was described as clean, cooperative, and a willing worker. She was considerably less seclusive. A slight degree of timidity was present. No disorder in stream of mental activity. No delusions or hallucinations elicited. Well oriented. No self-mutilating tendencies. In July 1935 was permitted to work in the home of a medical officer. At this time her weight had jumped from 129 lbs. to 166 lbs. From being a slender, pale, emaciated patient, she began to look plump and buxom. She highly rouged, powdered, and perfumed herself. Her affect, formerly rigid and apathetic, became mildly euphoric. She appeared vain, egotistical, and flirtatious. She was agreeable and a good worker. Continued to laugh a bit too freely. At times would take things which did not belong to her. During May 1936 she was

placed on convalescent care in the custody of her husband. Her appearance and behavior remained much the same as described on July 1935. April 1937, however, she made an unusually good impression. She was neatly dressed without extremes of color, rouging, etc., which formerly characterized her tastes. She discussed her family life and said that her mother-in-law had recently died; that this elderly woman had been quite a burden during the convalescent period; that she now felt much relieved. She discussed her husband's activities, evidently gets along quite well with him, has a garden which stimulates her interest. Expects to take up nursing in the near future. Her general attitude and discussion was a quite natural one. Discharged by the clinic physician on May 8, 1937 after completion of a year on convalescent care. Condition: Much improved.

This schizophrenic patient has continued in a state of recovery for 11 years. During all this time she has handled her household responsibilities efficiently and has continuously engaged in gainful occupation as a private duty and general hospital nurse. She takes an active part and has held office in various social organizations. The author had an interview recently with her husband who claims that he "has never known her to be in better state of mental health. During the past 11 years she has not shown any mental symptoms at any time."

Another interesting feature about this case is the precipitate loss of weight in relation to the onset of the psychosis and a gradual gain in weight associated with recovery. The patient's usual weight, prior to onset of psychosis, was around 194 lbs. During the psychosis the lowest weight recorded was 129 lbs.; this was on December 3, 1930. When placed on convalescent care, May 1936, she weighed 221 lbs.; this shows a gain of 92 lbs. At the present time, January 1948, the patient weighs 250 lbs.—a total gain of 121 lbs., as compared with her lowest weight in 1930. A chart was made of the patient's weight record from the time of admission to the time of placement on convalescent care; it showed curious precipitate losses of weight during the early phases of the psychosis and equally curious precipitate gains in weight during the later phases of the psychosis. Loss of weight and even more obviously gain in weight occurred in spurts. She would suddenly take on several pounds, which she would hold with slight fluctuations for a certain period of time; then she would again take on several pounds which were once more followed by another more or less stationary interval.

The wetting and soiling, which occurred in both cases, has nothing whatsoever to do with "regression" to a phase alleged to resemble infancy. It is quite definitely due to autonomic imbalance of bladder control.

The delusion of having syphilis (other cases believe they have cancer or tuberculosis), is usually interpreted as symbolic of incest by the psychoanalytic school. Our interpretation is that the schizophrenic psyche *intuitively* senses an impending filthy stagnation of the organism, so to speak, with all the odor and foulness of a swamp. Psychiatrists glibly dismiss without investigation complaints by the schizophrenic patient of fetid bodily excretions ("I stink"): bromidrosis, fetid or sour body odor, menses and perspiration, being satisfied that they are *always* due to olfactory hallucination. They are often an objective symptom. Such complaints actually have more significance from the standpoint of organismic therapy, provided you know how to tackle them, than delusional and hallucinatory material. In the author's opinion, the symptom of fetid bodily excretions, as described above, is *one* of the manifestations of organismic disorder.

CASE 2.—Id. No. 293351. Admitted to the Binghamton State Hospital on August 10, 1936. Diagnosis: Schizophrenia, catatonic type. Age 36 years. White, married, male. A railroad switchman.

F. H.—Inadequate. Father was subject to periodic alcoholism.

P. H.—Born in Binghamton, October 1899. Early development thought to have been normal. He completed common school; considered of average intelligence. At age of 14, discontinued his education to help support his mother. He found employment with a railroad and worked his way up to switchman; continuously employed for a total of 23 years prior to onset of psychosis. At the age of 29 years, he married a woman one year his junior. There are three children by this union. The patient's wife described the marriage as "happy and normal." He has been subject to hay fever for the past several years.

Personality Make-Up.—Quiet, friendly, always somewhat stubborn, but very agreeable if approached in the right manner. Before marriage he went to dances and took part in various social activities. Since marriage, he prefers to stay at home, claiming that he went out enough before marriage. He had no outside interests except baseball. After his mother's death, the patient used to go on sprees lasting a week. He has not indulged in alcohol for the past ten years. His main interest was cen-

tered in his family. He attended church and lives up to his religion in every respect. "For about two months prior to admission, since he took 'toxin' treatments for hay fever, he has become irritable and snappish and more recently has lost interest in everything."

Onset of Psychosis.—In June 1936 the patient started taking a series of 5 "toxin" injections for hay fever. After the first treatment the patient's face was puffed and red for some time, and he was hardly able to walk home. Each treatment seemed to make him worse. He complained of weakness, was unable to sleep, had headache and chills, drank a lot of water. By July 28, 1936 he was compelled to give up work. He began to be talkative, asked unusual questions, such as "How is your father and mother?" "You got to have faith." He could not bear to have his wife leave him alone; refused to eat, claimed it was too hot to eat. His physician then sent him to a general hospital for observation, where he remained for 4 days. In the hospital he refused to talk and kept trying to get out of bed. Although certification was advised, his wife took him home and placed him under the care of two nurses. His condition grew steadily worse. He imagined that he was a banker, said he would be all right if he had an onion, had to be dressed and spoon fed. There was blocking and a suggestion of cerea flexibilitas. He said: "I am holding my breath to save my wife. . . . . Do you know any dope places? I am blind." It became necessary to commit him to the Binghamton State Hospital.

On Admission.—Apathetic, untidy, paced restlessly about the ward. Wet and soiled. Occasionally required spoon feeding and had to be told to dress himself. Facial expression was silly and vacant, his eyes were usually open and showed fixed gazing alternating with furtive glances. His reaction to what was said or done was automatic and obedient. Muscles were tense. Emotional responses were inadequate. Jokes elicited a silly smile. There was no variation of behavior when visited by his wife, except that he would cling to her garments when she was about to leave. His productions were monosyllabic. He wrote his name with a pencil and then crossed it out. When an attempt was made to interview him with the written question and answer method, the patient responded by gestures indicating that he hallucinated God's and other voices.

Physical Examination.—Asthenic type, pigeon breast, sallow complexion. Heart, lungs and abdomen were negative. Blood pressure 130/100. Deep reflexes, hyperactive. Pseudo-clonus of both ankles. Reaction to light: right, sluggish; left, prompt. Consensual reaction: both pupils sluggish. Reaction to accommodation: both pupils diminished. Sympathetic reaction: both pupils dilate. Both pupils equal and miotic.

Subsequent Course.—For the next 8 years of hospital residence, the patient continued to show very little change from that noted above. During a period from November 9, 1937 to March 1938, he received a course of insulin shock therapy augmented with the usual injections of metrazol. A total of 64 injections of an average of 75 to 100 units each of insulin were administered. There was only slight temporary improvement which rapidly subsided when treatment was discontinued. About November 1944 he began to show improvement: more interest, better concentration, helped with ward work, and seemed more responsive. He still seemed to react to auditory hallucinations. A year later he was described as "much more spontaneous, cooperative, shows more ambition, and very helpful with work on the ward. He replied relevantly to questions, admitted hearing voices at one time, although claimed that he no longer heard them. No trends, or physical complaints elicited." By February 16, 1946, he made such marked improvement that the ward physician contacted his wife relative to the possibility of placement on convalescent care.

The preconvalescent report of the social worker indicated that the patient's wife was not anxious to have him return home, and the railroad officials rejected, completely, all future prospects of ever re-employing the patient.

The patient's wife stated that she had to bring up his family alone for 10 years with assistance from A.D.C.; that as far as the children were concerned, the patient was practically a stranger. They are ill at ease around him and he did not make a good impression on his 15-year-old daughter. This girl is highly sensitive and feels keenly the fact that her father is a patient at the State Hospital. Because no boys so far have shown interest in her, she feels that this is because they do not want to associate with a girl whose father is "crazy." Others have often brought it to the children's minds that their father is mentally unbalanced. His wife stated that it would be very hard for the children and herself to adjust to his presence home; she had become reconciled to the fact that her husband was in a state hospital and had governed her life accordingly.

The patient's former employer said that he would never have any chance of getting back on the railroad as a switchman, that they had enough accidents employing people who were considered normal and no one would take the responsibility of employing anyone who had been in a state hospital. The railroad was laying off men, and there was no opening for the patient.

The above picture will suffice to indicate the degree of frustration to which this patient was exposed after he was considered ready to leave the hospital.

On March 28, 1946, the patient was delighted to know that he was to be placed in family care, for he had spent over 10 years in the hospital. His mental condition was considered much improved.

A month later he found himself a job in a tea room at $25.00 per week. Four months later, through his own efforts, the railroad gave him a job in the freight office.

The ward physician saw him on September 20, 1946, at which time he made an excellent impression: looked well physically, was well dressed, alert and spontaneous. For all practical purposes, the patient seemed recovered. He attributed his

improvement to the fact that he suddenly began to feel much better physically.

By April 1947 the patient once more took up normal life with his family. The children gradually became adjusted to his presence in the home. As to his personality, the wife considers him to be about the same as he was before he developed his psychosis. The only change that she notices is that he is less bashful and shy than he was formerly, and also shows more aggressiveness. He remains at home most of the time when he is not working, often assists with the housework. He does not have a great deal of recreation since he works from 4 p. m. to midnight. However, during the day he frequently goes to an early movie and a couple of times a month he and his wife go out for dinner and to the movies. Since April 1947 he has been employed as a switch-tender on the railroad. He earns about $50.00 a week. His employer has told him that possibly, after he works as a switch-tender for a year, he may be given his old job as switchman. The job which the patient is holding at the present time entails a great deal of responsibility, inasmuch as he throws the switches for trains going through a large railroad terminal.

CONCLUSIONS

The author has reported the clinical course of two advanced cases of schizophrenic organismic stagnation, in whom recovery from the psychosis occurred spontaneously, because in his opinion they suggest the following constructive points:

1. That schizophrenia is, potentially, a reversible functional disorder of the total organism.

2. That a potentially schizophrenic organism is subject to certain variable susceptivities which do not characterize the relatively normal human organism. Associated with these variable susceptivities is an increased degree of emotional hyperaesthesia, resulting probably from a consensual biochemical heightening of irritability in certain parts of the nervous system, which, for functional reasons peculiar to the schizophrenic organism, becomes reversed into emotional anaesthesia or a condition usually described as "withdrawal."

3. There are schizophrenic organisms and schizophrenic organisms, allomorphic schizophrenic organisms, so to speak, which display a series of related, yet variable, organismic responses and syndromes.

4. Profound schizophrenic stagnation, *per se*, need not imply irreversibility.

5. In schizophrenia, psychosexual frustration appears to be only an aggravating or contributory factor in the development of the psychosis.

6. Opinions on prognosis in schizophrenia are only relative and not absolute.

7. Profoundly stagnated schizophrenic patients *may* recover from the psychosis without narcosynthesis, psychoanalysis, shock therapy, etc., and the field for research into conservative methods of treatment is still virgin soil.

8. The delusions and hallucinations in schizophrenia are symptoms and not causes.

9. Each case of schizophrenia presents an individual constellation of therapeutic problems.

10. All narrow and dogmatic concepts as to the nature of schizophrenia may deprive a patient of possible recovery.

11. A broader, more flexible, and organismically oriented concept of schizophrenia and its treatment seems not only desirable but urgent.

12. Schizophrenia appears to be one aspect of a chronic disorder of the organism, associated with peculiar susceptivities, whose terminal phase is characterized by psychotic manifestations.

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THE HOSPITAL TREATMENT OF DEMENTIA PRÆCOX [1]

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This is a study of the hospital treatment of women suffering from dementia præcox. The histories of 100 women patients admitted consecutively between 1942 and 1946 to the New York Hospital—Westchester Division have been reviewed in detail.

Admission was by voluntary application in almost two-thirds of instances. The remainder were certified to the hospital by court order. The average age was 28, with a range of from 16 to 52. About 75% were below the age of 35 at the time of admission. As a group these women were above average in intelligence and had enjoyed superior educational and cultural advantages. Of the 100 patients, 54 were diagnosed as suffering from catatonic dementia præcox, 40 from the paranoid type, and 6 from hebephrenic præcox.

Family History

The family histories revealed psychoses, neuroses, or alcoholism among close relatives of 88 patients. Over half the patients had one or more of these disabilities in the immediate family group of parents and siblings. One or both parents of 26 patients had suffered a psychosis; 17 patients had suicides among siblings or antecedents. Psychoses in siblings were present in 12 instances.

Of dynamic importance in the illness of 52 patients was the fact that the home was broken in infancy, childhood, or adolescence by the death, separation, divorce, or psychosis of a parent. In many instances where the removal of a parent from the home played an important rôle in the development of a personality vulnerable to mental illness, it was noted that the patient was in late infancy or early adolescence at the time when the home was broken. Instability in the home, particularly during late infancy and early adolescence, appeared to be of critical importance in these patients and marked the beginning of personality changes in an unhealthy direction. One patient, whose beloved father died when she was 5, became cold, withdrawn, and sensitive at this time. In her adult life she displayed the repeated pattern of falling in love with married, older men. It was the conflict over just such a situation that precipitated her mental illness.

Almost 75% of these patients had inadequate parents. Fathers were rigid, cruel or interested only in work. Mothers were openly rejecting, neurotically centered in themselves, or else smothering in their oversolicitousness. Only one-fifth of the patients had parents who extended consistent affection and firm supervision and guidance to their children through infancy, childhood, and adolescence. Among these parents were those who in late adolescence had lived through periods of turmoil, with ideas of reference, shyness, and withdrawal. They had helped themselves, or had been helped, to balance their lives and achieve stability as adults. They proved understanding of their children's problems and were of extraordinary help in the ultimate readjustment of these patients.

Infancy Period

It was found that one-third of the patients had had critical illnesses during this period. Several had undergone operations before the age of 5 and had reacted with panic. This insecurity, when associated with rejecting parents, was devastating in its effect on the personality development of these patients and prevented them from achieving a feeling of "belonging."

Three-fifths of the group were described by parents as "model children"—"good babies"—"never giving any trouble"—"never crying." This passivity was frequently carried over into adult life and was displayed in a lack of drive or ambition. In contrast to the "good children," almost 20 others were outstandingly stubborn and overactive and in-

[1] Read at the 104th annual meeting of The American Psychiatric Association, Washington, D. C., May 17-20, 1948.

From the New York Hospital—Westchester Division.

dulged in frequent temper tantrums and destructive activity, which made their infancy well remembered by their parents. Eleven patients were seduced by older relatives, friends, or strangers in infancy. These were notably immature in their psychosexual development and during their illness manifested an urge to repeat the infantile sexual experience, which was usually of a perverse nature.

Adolescence

In adolescence, almost one-fifth of the patients went through short episodes of strange behavior in which vagueness, preoccupation, withdrawal, and hallucinations were noted. One adolescent, at 14, after having been an active, mischievous, high-tempered tomboy, suddenly went through a period of marked personality change in which she fancied herself a saint and was preoccupied by vivid religious phantasies and hallucinations. Several additional adolescents experienced short periods of being shy and withdrawn, during which they expressed great concern over bodily changes. However, sudden and marked personality change in adolescence was not typical of the whole group. Inadequate patterns of behavior already existing gradually became more obvious and crippling, in reaction to the greater reality demands of adolescence and early adulthood.

About one-third of the patients in their late teens began a hectic and explosive type of sexual life, both homosexual and heterosexual. These displayed no real love or tenderness toward their sexual partners; the relationships lacked any permanency or plan for marriage.

Vagueness as to goal and a lack of real drive and well-directed ambition were typical during the adolescence of this group of 100 patients. Frequently proud and sensitive, many displayed great ambition as expressed in secret phantasies, but there was little effort made to develop skills and talents related to their ambition. The more introverted or shut-in group often concentrated on religious and intellectual interests at this age, to the exclusion of social and recreational interests. The more extroverted, predominantly those with a vigorous, athletic type of habitus, became restless and overactive and developed compulsive interests in sports or, as their parents expressed it, "wanted to be always on the go."

Discussions with patients during their hospitalization led to the typical finding that each of these two contrasting patterns was an attempt to escape from the responsibility of meeting realistically the rising challenge of adolescent sexuality. Masturbation with conflict, often associated with phantasies of incest, homosexuality, or other perversions, had frequently preceded the development of unbalanced interests, and these interests were substitutes for sexuality.

Adulthood

Three-fifths of this group had some college education. Forty-nine, or almost half, had married but only 32 had children. Almost all these mothers made a poor adjustment to their children. The married women, as a rule, were unable to achieve the adult toughness necessary to stand the give and take of adjustment to marriage and parenthood. They were unprepared for this adjustment, often because their parents before them had not been healthy models for identification as mates and parents. Nine-tenths of the married women were described as "cold" and "frigid" in their sexual life or merely as "disgusted with sex." Of the 32 mothers, 25 became mentally ill within one year after a pregnancy, abortion, or childbirth. Seventeen married women had no children and several of these had induced abortions.

Precipitating Factors

Of the 100 patients, almost two-thirds were precipitated into mental illness by factors concerned with sexual function, such as conflicts over heterosexual or homosexual interests in two-fifths, and concern over adjustment to motherhood, pregnancy, and abortion in one-fourth. Five patients reacted by illness a short time after the removal of a parent from their home by death, war, or mental illness. Marital discord best describes the precipitating factor in 3 cases. The remaining one-fourth of the patients gradually developed their incapacity over many years, with no single factor predominating. These patients displayed a general inadequacy of

response to life situations going back into childhood and early infancy.

Those whose illness was preceded by dramatic situations causing unusually great stress and emotional pain more often responded well to treatment than those who became ill in response to the more usual and expected stresses of adult life. To illustrate: one able, competent mother and wife became psychotic when 2 children burned to death, a third was severely ill, her husband went to war, and she was forced to live with her in-laws with whom she was not compatible. She recovered after a year's illness and has remained well over 3 years. In contrast to this was a 27-year-old single woman, who had been a stubborn, hot-tempered child and became a withdrawn, sensitive, and cold adult. She reacted with a paranoid illness in response to factors involved in changing her position. After 3 years of hospitalization she remains ill in another hospital.

The direct relationship between so-called adequate precipitating factors and a good prognosis would seem, from our experience, merely to attest to the relatively greater stamina of a personality which succumbs only under extraordinary stress. Such a personality structure can mobilize greater energy to resolve those problems which precipitated the illness, besides having more diversified interests and capacities from which to gain eventual satisfaction in reality.

The review of the symptomatology of this group of patients reveals little that Kraepelin and Bleuler and Meyer have not already described. It was noted that patients who displayed a strong, affective quality in their illness, as expressed in depression, suicidal drives, anger or combativeness predominated among those who responded well to treatment. Many patients who ultimately did well continued while ill to display a concern with the problem which precipitated their illness. Even though on the surface the trend and behavior appeared bizarre, they indicated a struggle on the patient's part with the real life problem. This would indicate that close observation of the patient's trend and activity during the acute phase of the illness is advisable, if the physician is to learn the nature of the patient's psychological problems and thus be able to aid him in resolving them. It was noted that patients, particularly catatonics, frequently live out the drives about which they were in conflict before their illness, and this "acting out" in a proper psychological environment of understanding and tolerance can be an important part of the process of recovery.

Some symptoms of mental illness are no more than a kind of blowing off of steam, and are not necessarily ominous or fraught with the dangers of a deteriorating regression. Verbal spats often help to clear the emotional atmosphere and in the long run may help people to live happily with one another. When overwhelming physical pain is present, nature kindly places us beyond its reach, temporarily, by the symptoms of shock. Each of us can recall reacting to periods of great emotional torment by withdrawing temporarily from life to nurse our psychological wounds. The patients in this group sometimes struck out blindly in an attempt to fight a fate which caused them suffering, or withdrew within themselves, for a time, to build up courage before taking up the struggle of life again. Symptoms can be psychologically constructive in nature. Understanding the possible significance of behavior in our patients can thus lead to better timing of treatment procedures.

The personalities of these 100 patients varied so widely that sweeping generalities are difficult to make. However, as a group they were predominantly tender-minded and sensitive. Many kept notes on when the physician visited them, how long interviews lasted, where on the physician's list of appointments they stood. Their mood for the day often was determined by such factors and their interpretation of them. This was true even in the case of some acutely disturbed patients. One patient held a grudge against her physician for several months because on one occasion, at the end of a wearing day, he so far forgot his manners as to sit down during an interview, while she continued to dance about the room in a seminude state. She resented the fact that she was not treated as a lady, and it was only after this was talked out some months later that she developed a positive personal relationship with her physician.

Self-centeredness or narcissism among

these patients was greatly exaggerated. A complacent acceptance of dependence and the expectation of infinite service and infinite tolerance from others, with petulance when their wishes were not immediately gratified, were common aspects of their personality pattern. One patient displayed her narcissism in anticipating the visit of her 3-year-old daughter after an absence of $2\frac{1}{2}$ years by saying: "I can hardly wait to see Ann; now I will have a new audience." This same patient prepared to attend a dance by donning a diaphanous gown without bothering about undergarments, so that her menstrual belt and pad were clearly visible beneath her dress.

An introverted or shut-in type of personality predominated. It would seem logical to connect this exaggerated dependence on inner mental experience with the fact that the emotional environment of infancy and childhood among these patients did not afford repeated emotionally satisfying experiences. Thus a turning inward for satisfaction was made easy. Introversion was suggested by a preponderance of interests involving solitary activity, such as reading and the arts; intellectual interests of an esoteric, philosophical, and religious nature; and sports which did not involve group participation, such as swimming, riding, or golf. Many of these patients seemed to give, early in life, the impression of intellectual precosity. One relative reported that her daughter "seemed born old." But in spite of the glib philosophical statements which made some of these patients seem disillusioned in their teens, their behavior displayed little real understanding of life. One patient neatly expressed this as follows: "I can hear the band playing, but I can't find the parade."

There was a striking unevenness in the development of the various aspects of the personality. In general, emotional maturity lagged far behind intellectual growth. Interest in profound philosophical and religious subjects often preceded by some years direct attempts to manage the realities of interpersonal relationships, particularly with the opposite sex. The patients as a group had few friends; many limited their friends to but one sex. Some, because of the nature of their psychosexual immaturity, remained on an adolescent level, centering their lives around groups of their own sex who had esoteric interests. One middle-aged patient relied in great part upon an organization known as the "Serious Thinkers." They often clung to emotionally dependent relationships with one woman friend. Others, in an early adolescent attitude, sought the companionship of older men and women who, as parent figures, were the object of their hero worship and their dependency. Unconscious phantasy played a large rôle in such relationships, as outlined above. Among the patients who responded least well to treatment were a few who never developed the capacity to make any close friends outside their own homes.

Among patients who developed a catatonic form of dementia præcox were found many outgoing extroverted personalities. Several such patients had many friends of both sexes, displayed evidence of good drive and ambition, and achieved extraordinary success in both school and work. Close personal relationships, however, were apt to be brief and to end stormily. Goals were changed frequently and enthusiasm waned easily. The catatonic patients as a group displayed a tendency to live out their drives and to make a real effort to meet their problems and improve their adjustment. They displayed more curiosity about life and dared to try out new situations. It was this capacity for extroversion of their energies which made them more amenable to psychotherapy.

A striking feature of the personality of many patients was their lack of grace and poise. Many of them had been inhibited in their infancy and childhood by oversolicitous parents, who prevented them from engaging freely in play and physical self-expression. Such patients gained much in the hospital from a program of physical education planned to increase muscular coordination.

Treatment

Coincident with the contributions of Freud there developed an increasing emphasis on the psychotherapy of dementia præcox. However, the belief remains prevalent that these patients lack the ability to achieve a workable transference relationship. As others

have shown and we have observed, many of these patients are as capable of achieving a transference as those with psychoneurotic reactions. Among this group of 100 patients, almost three-fifths developed a strong and workable personal relationship with their physician which stood the test of their daring to accept the challenge of emotionally painful situations, and which demanded of them a sublimation or better management of infantile cravings. Thirty-three patients were able to achieve an adjustment in work and personal relationships, after their departure from the hospital, which indicated a more mature personality organization than had been achieved before the onset of the psychosis.

It is our impression that, regardless of what has been said concerning the nature of schizophrenic thinking, if an attempt is made to understand the language and the symbolic behavior of dementia præcox patients, it is possible to establish rapport with them. A catatonic patient of 19 rushed up to the physician, impulsively grabbed his notebook and pencil and hurriedly scrawled the following sentence: "Be patient with my father; he wants to mix his sperm with my ova." When the physician responded by saying that girls in their teens usually felt deep love for, and dependence on, their fathers, the patient for a few seconds assumed the dignity and poise of her 19 years, looked with affection at the physician, put her hand on his in a tender gesture of warmth, and said, "You understand." From this point on, the patient responded to the physician's guidance and made continued progress to recovery. Too much attention may be paid to how a schizophrenic is thinking and too little to what the patient means in terms of conflicts and unsuccessful attempts at solution.

Many patients in this group had regressed to an early infantile state of passivity and dependency. To expect them, at this level of regression, to respond with the directness and warmth of an adult, adolescent, or even a child, is irrational. Our attitude as physicians often must be similar to what we would display as parents to infants between birth and 3 years of age. The physician should develop a feeling of real and intense interest in the patient's problem of living and a tolerant acceptance of the facts of his behavior so that wetting, soiling, feeding problems, and infantile sexual activity can be accepted as objectively as we would accept such behavior in an infant. The interest in, and understanding of, the abnormalities and maladjustments of the patient should be balanced by a faith and interest in his assets and the awareness that, in the long run, the tendency to adjust and get well is generally present.

Because the lack of a close relationship with warm and supporting parents had stunted these patients in their personality growth, treatment was primarily concerned with helping them to live out such frustrated needs in a more healthy environment. In many patients, tube-feeding proved to symbolize an infantile nursing experience and provided an opportunity to develop an association with the physician on a deep and fundamental level. Patient and careful spoon-feeding by understanding and motherly nurses provided a mother experience in many patients which was of great importance in the later development of a feeling of belonging which they had previously lacked.

Involved in the treatment of many patients was the problem of providing a healthy emotional atmosphere for a kind of second growing up. Many patients talked of being reborn and some spoke of reliving experiences which were part of their early infancy period. The problem was often to help the patient live through again typical infantile and childhood experiences which were of a more constructive nature than the original experiences. One 18-year-old girl, under treatment for a catatonic illness, had been cruelly forced into the rôle of a submissive and coy southern belle with intellectual pretensions. What she wanted to be was a good tennis player and rider, and to go to a small college of modest intellectual standards but outstanding recreational opportunities. In her illness she concentrated on active sports and with her parents was aggressive, swore, and demanded whiskey and cigarettes. Through contact with the physician, the parents gradually accepted their daughter as she was: accepted her need to express her pent-up rebellion as evidence of a struggle toward achieving adult status, sent her presents of cigarettes, and took pride in her being elected

captain of a patients' basketball team, while ignoring her failure at the patients' dances. As the patient began to sense their changed attitude and to realize that they approved of her being herself, she abruptly displayed the progress which continued until her recovery.

Another patient had missed demonstrative love and affection from her cold and rejecting father. He gradually gained insight into his daughter's deep needs and was able to unbend, and to give to his daughter, then regressed to an early infantile level, the warmth and affection one would give an infant. Following a short period of anxiety and suspicion that her visitor was not her father, but a stranger masquerading as her father, the patient responded by improvement after a few visits during which he was more sympathetic and understanding.

Another patient, strongly ambivalent toward her mother, was informed of the mother's sudden death. Immediately she rushed laughing to a piano, played a funeral march, and then announced: "There goes mother, feet foremost." This episode was used as a starting point to help the patient gain insight into the devastating result of her unsettled conflict over her ambivalence toward her mother. She responded to this understanding and was better able to integrate her personality.

In reviewing the problem of adequate treatment in this group, it is apparent that this must include a therapeutic relationship with a constellation of relatives and friends, closely involved in the patient's life. In the younger group of patients, the physician's relationship with parents and siblings was often a greater factor in therapy during the first months of hospitalization than was the direct contact between the patient and the physician. Relatives and friends need education to develop some understanding of the dynamic factors involved in interpersonal relationships. The treatment situation is much like that commonly found in child psychiatry, where psychotherapy of the parents is as important as that of the child with the obvious emotional disorder. Teachable parents and husbands repeatedly proved in this study to be most important factors in the ultimate recovery of the patient. Feelings of guilt over failure as parent or husband were frequently disguised as attitudes of suspicion and criticism of the treatment. Guilt over rejection of, and hostility toward, the patient is often seen in the guise of oversolicitude. An understanding and reassuring attitude on the physician's part as he patiently hears the relatives' story helps to resolve reactions of guilt and hostility and to build up confidence in the physician. Relatives then become amenable to being taught how best to act and react during their visits to the hospital. Many hours of work were done with relatives. The timing of visits, the careful choosing of the visitor, and his development of deeper understanding of emotional attitudes proved to be of outstanding importance in the early stages of treatment.

Like children, patients suffering from dementia præcox respond with great sensitivity to the feeling of those about them, and are less impressed about a spoken word. Visits from relatives were kept at a minimum during the early months of hospitalization. In the meantime, the physician's contact with the relatives helped him and them to develop an understanding of what was taking place, in terms of the patient's conflicts and attempts at resolving them, and the rôle that each relative was playing in the present phase of the patient's illness. Explanations by the physician were given in simple words, avoiding technical terms. Explanations were best understood when illustrated by experiences common to us all. Discussions of the manifestations and meanings of infantile sexuality were well tolerated by carefully chosen relatives, when the physician took the time to establish a warm relationship with them and to lead up gradually to the subject through many interviews.

Results

One hundred women patients suffering from dementia præcox were treated at the New York Hospital-Westchester Division between 1942 and 1946, and the present status of these patients was determined. Besides the usual therapeutic procedures, including intensive psychotherapy, physical education, occupational, physiotherapy, and a program of socialization, all these patients received electric shock treatment. Electric shock therapy was given primarily to im-

prove the patients' contact with the environment so that they might become more responsive to other therapeutic procedures. A series of treatments was limited to from 6 to 8 convulsions. Repeated series were given to almost one-third with an interval of at least one month between series.

Of the group of 100 patients, 67 are now at home and improved at the end of a follow-up period of 1½ to 6 years. Forty-three are considered recovered and, of these, 33 are functioning on a better level than ever before in their lives. Of the 54 catatonic patients, 76% are at home, 57% recovered, and 11% much improved. Of the 40 paranoid patients, 30% are recovered, 17% much improved, and 60% are at home. Of the 6 hebephrenic patients, 2 are at home, neither recovered.

Ten patients relapsed while at home and are now in a hospital under treatment, and these are included among the 33 patients not benefited from treatment. These 10 were more than balanced by 16 who left the New York Hospital-Westchester Division for other hospitals in an unimproved state, and now, 1½ to 6 years later, are at home recovered, much improved, or improved.

The importance of the use of electric shock therapy as an addition to a total psychotherapeutic effort is indicated by the comparison of these results with those published by Cheney and Drewry, obtained in a group of 500 dementia præcox patients treated a few years previously in the same hospital by similar methods, except that shock therapy was not given. Of the 500 patients, only 26% were recovered or much improved at the end of a follow-up period of from 2 to 12 years. In contrast, 57% of the shock-treated group were recovered or much improved. Of the catatonics, 38% were much benefited by treatment which did not include electric shock, compared to 68% of the shock-treated patients. The most marked contrast was in the paranoid group, where only 15% of the nonshock-treated group were at home and substantially benefited, while 47% of the shock-treated group were at home, recovered, or much improved.

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AN EXPLORATORY TRAINING TECHNIQUE FOR THE RE-EDUCATION OF CATATONICS[1]

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INTRODUCTION

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The meager success psychiatry has had in the treatment of the catatonic schizophrenic patient is a challenge to all workers and students. This pilot research in the coordinate fields of corrective therapy and educational therapy suggests some new possible avenues of approach. The research is primarily in the field of relearning and gives little stress to the development of insight. While this work has been done with a small number of patients it should encourage others to explore further the possibilities of the technique.

The meticulous procedure established by Mr. Roland and Mr. Taylor is highly commendable, and others who undertake this or similar projects should carefully review their work. Some of the high lights of this paper are the careful observations, the accurate recordings of these observations, and the lack of any claims that this technique is a panacea for the treatment of the catatonic schizophrenic patient. No attempt should be made at the present time to evaluate or interpret the dynamics. The reason for this is that there are too few cases to justify any attempts at interpretation.

EXPLORATORY TRAINING TECHNIQUE

With the ever-increasing population in our veterans psychiatric hospitals, and the inability to give individually adequate treatment to all, there has been a great marshalling of new techniques, along with older ones. The corrective therapy department of the Danville Veterans Administration Hospital, working under the direction of the ward psychiatrist, formulated a new procedure for treatment of catatonic patients with encouraging results. The initial experiment indicated a rôle of educational therapy as well, and corrective therapy and educational therapy formed an integrated team in carrying out these new procedures. The techniques used were applicable to group methods.

It was decided to apply these techniques to catatonic schizophrenics because many of these disabilities present nursing problems in the mental hospital. The neglect of attention to even the basic needs of life by the patient makes necessary costly nursing procedures to maintain his physical condition even marginally. Regardless of the mixtures used in tube feeding and other methods of food administration, the catatonic often emerges from his relapse in a physically weak state. In consideration of the present unit cost of labor, assignment of nurse and attendant personnel to such patients requires maintenance of a very expensive nature. Therefore, any technique which can shorten the period of relapse may be of great value, both to the patient and to the institution. So far, our techniques have not been used in conjunction with shock therapy, although such a series may be treated later. The initial group was composed of men of World War II, ranging from 18 to 30 years of age. None had suffered physical disabilities worthy of note. The average educational level was that of high school.

The program combined known corrective therapy techniques with simple suitable features of educational therapy, with two distinct phases of the program for each veteran. The classes were set up on a 5-day week basis and each class was conducted for a full 2-hour

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The author is indebted to Mr. R. H. Taylor of the educational therapy section, who has given valuable assistance as well as many suggestions and is actively connected with this clinic.

period. At the outset, the efforts were exploratory in nature.

The group exhibited the following general behavior characteristics. The most noteworthy was their lack of external response, through either action or words, to stimuli. The group was entirely uncommunicative. There was a common lack of ability to perform even the simplest of skilled acts, like drawing a straight line on a piece of paper or tying a knot. Again we noted another group similarity in their inability to relax in any normal degree.

It was decided the first item of treatment must be a relaxation technique. Patients were placed on the relaxation table and various methods were used to obtain conscious relaxation. The instructor first moves the patient's arm passively and urges him to relax. The patient gradually will allow unrestricted movements to take place without muscular effort and offers no resistance to the gravitational drop or release of the part.

The next and most difficult step is obtaining free movement of the mouth and relaxation of the larynx. This requires individual encouragement and is a very important feature. Verbal response and concentration on external activity is our first objective. In the majority of these cases the tongue is curled up against the roof of the mouth and it is first necessary to get the patient to move his mouth freely and push his tongue out. Then as the patient relaxes on the table the instructor, in a low voice, speaks to him, using phrases like "I am here to help you. I know that you have trouble talking but if you follow my instructions, I will help you," etc. Under the soothing drone of the instructor's voice the patient's arms are moved passively. As the exercises progress the instructor asks him to try simple sounds such as "oh," "ah," "oo," each being encouraged for as much as 5 minutes. When the patient makes satisfactory audible sounds, he is urged to try simple words like "dog" and "cat." If he indicates that he cannot or will not say them, he is urged to think them and move his lips as if he were speaking. Efforts become audible when these words are discernible in the strained expression and moving lips. Success in spoken words is given generous praise. Expressions of praise frequently given seem to be understood and appreciated by the patient.

After the patient begins to talk again the instructor teaches concentration in connection with the relaxation technique. The patient is asked such questions as these: where is your home? what is the month? what hospital are you in? etc. The questions become a little more complicated as the patient begins to verbalize his orientation to time and place and is able to recall things. The recalling of traumatic experiences many times produces muscular rigidity and whenever possible this is avoided. A patient is often given a newspaper while on the relaxation table and is asked to read an article. The instructor then asks him what he has read. Usually he does not recall it, but soon learns to concentrate on what he is reading under the guidance of the instructor.

Relaxation response techniques have proven valuable in feeding problems. One patient was assigned to the catatonic research clinic on June 24, 1947, with a statement from his doctor to the effect that he would not eat, had to be fed, and during a previous period had to be tube fed.

Relaxation response therapy started June 24 with the following results: 1st day, forced feeding was required, no noticeable results; 2nd day, forced feeding required, would drink milk voluntarily; 3rd day forced feeding required; 4th day, ate fairly well, part voluntarily, part by forced feeding; 5th day, ate double helpings of everything for breakfast, continued to eat other meals unassisted. Recheck on 8th day showed he had continued to eat voluntarily. Recheck on 10th day still eating voluntarily. Attendants report he not only eats what he is given but additional food in some instances. Patient is continuing therapy and is much more alert, active, and responsive as to time, place, and past.

In the series treated, supplementing the relaxation technique suggestive association was used. In this phase, 4 men were taken in 2 pairs, and grouped in a circle. The instructor took his position in the center of the circle with a volley ball in hand. The instructor passed the ball to each patient, and urged him to say the word "ball," and pass or toss the ball to the patient at his left, and so on until the ball had passed completely

around the circle. The result was slow, clumsy, and discouraging. Some of the patients couldn't catch, handle, or pass the ball, much less call it by name. Soon, through the persistent efforts of the instructor, all the patients were performing the exercise in a creditable manner. Not only did they respond to suggestion by calling out the name "ball" as it came to them, but they seemed also to develop a degree of alertness. It became evident that various members of the group had played soccer, basketball, or volley ball. The soccer player passed the ball by bouncing it off his head, and the basketball player made quick underhand or overhead passing shots while the volley ball player passed it by using a two-handed push shot to his receiver. Two of the men, slower in responding to suggestion, preferred to hold the ball, fondling it, turning it in their hands, appearing unable to recognize or call it by name. Weather permitting, the ball therapy was continued out-of-doors for the full period of the experiment. Definite week-by-week improvement in response to suggestion and concentration was noted.

Simultaneously with the relaxation technique, exercises in educational therapy were started with the group. Here again the plan was to work with the men in pairs; though often, if attention could be maintained, two pairs or four men were treated.

Striving for recognition of shape, size, design, color, and utilitarian value of common objects, we arrayed pencils and paper, cards bearing common geometric designs, spools, cones, cylinders, art objects, and elementary reading material on a work table where the objects would command point-of-interest attention. They were all quickly recognized by name, although art objects and drawings made less impression and evoked no particular interest. Progress was rapid and the sorting of spools, cones, and design-bearing cards into proper categories of shape, size, and color served to develop concentration and permitted the patients to become better acquainted with their instructors instead of resenting or fearing them.

Surprisingly, the pencil and paper device proved of greatest interest, and as the experiment progressed seemed to offer the greatest promise. Once the fear of being asked to sign something was dispelled, their reaction was spontaneous and sustained.

When a patient displayed interest in pencil and paper, the instructors started passive work on numbers from 1 to 10. As soon as the concentration response became apparent and a patient could write 1-2-3, he was encouraged to go ahead on his own. Each succeeding day they were urged to continue their number writing as far as they could carry it. In some instances a man would write down only the numbers up to 25. Another, to 100-200 and so on. Then numbers were dictated to them up to 100.

Then, as the next step, simple problems of arithmetic, such as addition, subtraction, and multiplication were attempted, passively and actively. The results were encouraging, both in response and sustained attention. At this point, somewhere in the 2nd week, drills in addition and multiplication were started with flash cards. This was done in order to secure an oral response on the part of the patients. At first only individual response was noted. As the assignment became increasingly complex, group attention and group response were attained.

Concurrently in this period simple hand writing technique, passively induced, was begun. Continuous straight lines, free hand circles, and ovals constituted the primary effort. Again as each patient responded and became able to sustain activity in these exercises, he was assigned more complex tasks.

At the outset of the lesson period each patient was asked to write his name and the date at the top of the page. From this he progressed to a full set of writing exercises copying from "Writing Practice" or the copy book. Also words and sentences were dictated and written. In writing frequent use was made of their names, date, home addresses, time of year, points of interest in their own localities, and local geographic facts. This was done for the purpose of establishing a reintegration of reality with old, formulated associations.

Well along in the experiment, the instructor purposely gave a patient a wrong date. He was immediately corrected, while the patients, with smiles and laughter, enjoyed a joke at the instructor's expense. Near the close of the experiment simple tests were de-

vised and given. These consisted primarily of word matching, term matching, circling words containing similar letters, circling words beginning with the letter "a," matching opposite words like "yes" and "no," "rain" and "shine," and many others.

Finally the men were encouraged to write letters to their family and friends. Suggested phrases like: "I am going to get well," "Mr. Taylor and Mr. Roland are here to help me," "I am improving," "My memory is better," "I am spelling better," also were used. Some of these letters were quite revealing. They showed definite improvement in relaxation, concentration, and sustained attention.

The following letter was written by one of our patients who had received intensive therapy. This patient previously was apparently disoriented as to time and place but is now making an excellent adjustment. He received no assistance from instructors in writing this letter.

DEAR MOM AND DAD:

Hope you are both feeling fine. I haven't had much of a chance to write letters lately what with my setting on the ward and my rehabilitation activities. I really didn't want to write this letter but here I am writing it so I suppose from now on I spend some of my time writing to you. It seems quite a while since I've written you. I can't seem to remember things that have happened the past few months but I don't suppose they have much to do anyway. I am feeling better lately.

Your son JAMES.

Twenty-six patients have received treatment in the clinic from April 15 to August 1, 1947. Favorable response was obtained in all but 2. Twelve patients who had not been talking previously are talking. There is marked improvement in all from the standpoint of verbalization, relaxation, orientation as to time and place, and concentration. Six patients have been placed on open wards and 6 have returned home. Twenty-one patients have been assigned to manual arts therapy sections and details. It has appeared advisable at first to assign patients to the shops or details on a half-day basis and continue the relaxation response activities the remainder of the time. Reports are sent back from the shops and elsewhere concerning progress. If the progress report shows that the patient is making a satisfactory adjustment, relaxation response activities are discontinued. In the event of a relapse the patient is immediately sent back to the clinic. Two patients have been returned for further treatment thus far.

In conclusion we would like to suggest a few pertinent points which may serve as a guide in contemplated corrective measures of this nature—points which developed as the experiment proceeded.

1. Patience and alertness are necessary on the part of the instructor in adjusting the techniques to meet the needs of the individual patient.

2. The development of ability to sustain attention is a primary goal.

3. Pencil work may very well be offered early in the experiment, provided it consists of simple assignments, such as writing small numbers as dictated, and progressing to simple addition and multiplication.

4. The use of devices calling for oral response are indicated and effective. Flash cards fall in this category.

5. Reading aloud, in the later stages of the experiment, is feasible but only if and when attention can be sustained.

6. Conversation should center around associations of time, dates, places, and situations in testing recall activities. Recalling military experiences or situations that are painful should be avoided.

7. Study of a patient's background gives important clues that aid in bringing him back to reality.

It is felt that these techniques are of value in alleviating certain schizophrenic symptoms and in hastening or inducing remissions that make for shorter periods of intensive nursing care and possibly shorter hospitalization. In addition, the patient gains physically, being able to feed himself and take an adequate diet.

THE PSYCHOANALYTIC CONTRIBUTION TO THE TREATMENT OF BEHAVIOR PROBLEMS IN CHILDREN[1]

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The trend in psychiatry at present is to approach the understanding of behavior in the light of psychoanalytic psychology. It is a universally accepted fact in all psychologies that neuroses and behavior problems are due to conflicts between the individual and his environment. This, Freud was the first to demonstrate. Among the many contributions of psychoanalysis to the complex problem of behavior, the most outstanding is his description of the origin of behavior patterns. Freud's data were gathered in long, careful research—minute clinical studies, the material from which drew attention to the fact that these behavior patterns are the results of the ego structure, which, in turn, is formed chiefly from environmental influences.

In addition to uncovering the unconscious, the dynamic functions of the psyche, Freud stressed the importance of the complete developmental history, from earliest childhood on, with particular emphasis on the first love attachments, frustrations, and the reaction to the initial manifestation of the sexual impulse.

We must admit that, although we have come a long way, scientific contributions in the field of child psychology need to be enlarged; the genetic picture of the infantile period before the age of 2 requires further examination. There are an infinite variety of emotional attitudes present during that early development phase, about which we know too little because of the absence of verbalization. Pediatricians describe conflicts in the first and second years of life as creating "a harassing effect on the personality of the child and mother." During the first year, the outstanding indications of conflict are feeding problems. In the second year, pronounced changes in the infant's personality, according to pediatricians, demand adaptability on the part of the mother. As a result of parental attitudes, a 2-year-old may be "tense, anxious, dependent, and self-centered"; thus the ground is prepared for the formation of specific neuroses and character disorders. The second year is considered by pediatricians to be "a vital phase for ego formation." (Spock, J.A.M.A., March 20, 1948.)

Thus we see that pediatricians have come to believe that, in order to understand the disturbances in children's behavior, the observation of their emotional development in relation to environmental pressures is indispensable. Pre-Freudian psychiatry attributed all neuroses to heredity. Psychoanalysis traced the source of personality development and personality difficulties to early childhood experiences. This approach does not completely exclude heredity, which is a factor in personality structure, but it calls for the inclusion of all possible factors in evaluating mental and emotional development. The most important of these are the earliest childhood experiences. The manner in which the child is influenced to control his early drives and impulses will result either in his being able to deal with the environmental demands and also his own drives, or will create in him a weak, intimidated, anxious attitude.

If the child is exposed to harsh intimidation, or is subject to no discipline whatsoever, he will be unable to cope with the environment and will develop defense measures which will manifest themselves in what we call neurotic symptoms or behavior problems. Whether or not those symptoms are serious—they may be social or sexual maladjustment, violent temper tantrums, aggressive or defiant behavior, sullenness—they all will serve as a protection against instinctual drives. The repression of impulses and the creation of defense mechanisms to prevent their emergence keep the child's psychic energies bound and weaken his ego strivings. Under these circumstances, a division takes place in the ego, and one part utilizes its energies to fight the so-called ego-alien impulses. The child learns to curb ego-alien

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impulses at the demand of his environment.

When it becomes necessary to treat the child for his problematic behavior, it will also be necessary to effect changes in the environment in order to improve the mutual relationship between child and parent.

Psychoanalytic psychology furnishes a fairly comprehensive guide to the manner in which these changes can be made. When we speak about early ego development, we think of the earliest developmental phase in its relationship to the mother. The ego at this period has only to reconcile instinctual drives with reality, which is represented by the mother. The progressive adjustment to educational influences depends on this earliest relationship, which if satisfactory allows for a sufficiently strong ego to be set in operation before the superego comes into being. This is the crux of the earliest developmental phase. If this first object relationship is not a very frustrating one and continues through the Œdipus phase to be fairly pleasant, the child will feel compensated for giving up egoistic, objectionable behavior. If the reverse happens, childhood developmental periods will be characterized by strong dependency, anxiety, weakness, ineffectiveness, or aggressiveness and rebellion, and we have problems of behavior.

Conflicts arise at different periods of development and, depending on their intensity, result in varying degrees of deviations in behavior. These peculiarities in behavior sometimes seem to disappear by themselves, but when this happens they are likely to break forth in a later phase of development. Infantile behavior and gratifications of an infantile nature may be carried over from the Œdipus period to latency and adolescence and, if these elements are strong, can seriously disturb the adjustment in later phases.

The amount of love, encouragement, and compensation which the child experiences in his process of education will determine the efficiency of his ego and his ability to evaluate reality. Up to 5 or 6 the problem in education is to support and strengthen the ego of the child at the same time that he is taught self-discipline. The basic organization of the superego is quite advanced by the age of 5. At the onset of the latency period, which closely follows the œdipal, the emotional relationships of the child take on a different coloring. The superego begins to exert itself and we have to watch to see that it does not become too severe. The child is eager to identify with his parents and their substitutes, the nurse and the teacher; and since the development of the superego is achieved partly through imitation and identification, it is necessary that the parents be realistic about the child's problems and their (the parents') relation to him in this phase of development. In so doing they will enable the child to identify with them as understanding parents rather than as intimidating and punishing ones who must be feared.

But the superego is not just a copy of the parents. The child's instinctual tendencies also enter into its formation. He has his own ambitions in the direction of independence and his repressed aggressive feelings evoked by parental domination create guilt which later becomes internalized, resulting in the creation of an even more severe ethical code than that of the parents.

In early development there obviously can be no harmony between superego and ego. The severity of the former depends on the intensity with which parents demand obedience and on the amount of hostility which arises in the child as a result of these demands. The creation of conflicts which lead to behavior problems can be attributed to the severity and sadistic components of the superego. We must bear in mind the fact that a healthy superego has a coordinating function in shaping the child's character. The problem is to achieve a realistic superego.

The latency period offers a good opportunity to modify neurotic behavior through manipulating the environment. But in order to utilize this period for therapy, one must make a thorough study of the conscious and unconscious drives, and at the same time the prohibitions which stand in their way, keeping in mind particularly the factors in the child's superego development.

The weak ego can then be strengthened by making the strong, harsh superego (environment) more lenient. The personality structure of the child is in the process of settling. As it is not yet fully crystallized, alterations are possible during this period of development. There must be a balance

between the administration of gratification by the environment and the amount of frustration imposed. The successful handling of the problem of deciding how many prohibitions and frustrations can be imposed, at what age level, and by what means to impose them, will result in the creation of a good foundation for social adaptation.

To demonstrate for the first time that human conflicts originate in a clash between the infant individual and his environment was a difficult task because Freud's studies were of adults, in whom conflicts are largely unconscious. In childhood, however, emotional attitudes and conflicts are on the surface and can more readily be seen in action. Developmental stages in the child are transient and in all of them he may temporarily show abnormal emotional reactions and deficiencies when disturbed home conditions are present. Even in the late phase of puberty, conflicts with the environment can be acute. In late puberty the superego may still give evidence of instability. In handling these disturbances the greatest tact is required because youngsters of this age group frequently exhibit the sensitivity of a child in combination with adult intelligence.

There may be ego weaknesses which do not permit the adolescent to give up his dependence, partly because, as mentioned before, the unsolved conflict of the œdipus period is revived at puberty and partly because of the parents' hold on the growing child and their reluctance to see him become independent. If the ego is weak, it cannot assume functions which are to an extent on an adult level. And a constant tension caused by the conflict over deciding whether to assume an adult role or hold on to earlier dependence will create an anxiety state or neurotic behavior.

Such disturbances can always be directly traced to the parents' attitude, which results from their own emotional problems, whether conscious or unconscious. This brings us to the phase of treatment of the maladjusted child which involves psychotherapy with the parent. Psychoanalysis emphasizes the necessity of parents and teachers adjusting to the child.

Material gathered through direct observation of the growing child has made the origin and meaning of symptomatic behavior more comprehensible and hence has taught us how to modify behavior. The possibility of modification depends on the degree of attachment of the young child to the objects in his environment and, as the wish for object relationships is always present unless it has been completely discouraged, the undesirable behavior can be altered if the environment offers a substitute gratification.

When searching for the factors which have created behavior problems we must survey all the life experiences of the individual from infancy. We are mainly interested in those experiences which have had the deepest effects. This focuses our general interest on the prevention of early traumatization.

Normally the ego and the rest of the personality structure make fixations at a particular level transitory, for whenever the child reaches a new developmental phase the drives toward maturity tend to pull him away from the earlier fixations. Thus the danger of retardation is reduced, as are the possibilities of regressive tendencies. However, where normal development has not taken place because of unfavorable environment and weak personality structure, the object of therapy will be to free the child from too strong fixation to the developmental phase which is expressing itself in his symptoms. These must be viewed from the standpoint of how much they interfere with the child's maturation. The degree of retardation will be indicated in the symptoms.

They should not be considered as a basis for prediction or as a measure of future adult disturbance, but as denoting a situation that must be managed currently. The stress should be not so much on the possible outcome in adult neurosis, but cure of the present childhood problem. With the former attitude there is frequently a tendency to dismiss the child's present predicament without sufficient consideration of it.

Therapeutic methods vary. It is universally accepted that the classical analytical technique frequently cannot be applied. Behavior problems frequently indicate a beginning of abnormality which may develop from simple neurotic illness into faulty character formation or psychotic manifestations. The methods of therapy must be selected according to the problem presented. Two main distinctions can be made at the outset. In

neurotic disturbances psychotherapy for the child will be of paramount importance, manipulation of the environment secondary, whereas in antisocial behavior changes within the environment will be primary.

The application of therapeutic principles is always based on the therapist's understanding and empathy in the emotional difficulties of the young. Therapy for children always involves education of the parents, making treatment of children complex and difficult, the therapist having not only the child's hostility to deal with but the emotional barriers and negative reactions on the part of the parents as well.

Progress in development depends on the encouragement the child's new ventures are accorded by his environment. His new activities will mirror his progress from one stage to another, and the most helpful attitude of parents and educators toward these new activities would be one of appreciation and encouragement. The new activities will represent a steady reality testing on the part of the child, which goes on during the whole period of development under normal circumstances.

Continual tension between instinctual drives and the superego during the course of development is natural. Hence the child is always in need of help in acquiring a more independent superego. As we have seen, the causes of neurotic behavior in children are many, but outstanding among them is insecurity. If the parents themselves are insecure, the child's feelings of insecurity will be aggravated. Preventive education for the parents includes making them conscious not only of their child's emotional needs but of their own problems with themselves and each other: their state of health, relaxation, freedom from anxiety, all that are required to furnish the child with the needed security.

Parental instability is an outstanding factor in the case histories of children with behavior problems. It is the prime cause of the continual shifts in attitude on the part of the children. When the parents' behavior is unpredictable to the child, it will be reflected in the child's character, because the most important mechanism in shaping character, *i. e.*, identification, is difficult under those circumstances. The longer the child is exposed to such an unwholesome situation, the stronger will be the pathological effects upon his early development.

The type of treatment one attempts to apply is determined primarily by the child's symptoms, behind which lie the history of his development. The transference relationship remains the most important tool in all forms of psychotherapy. This Freudian concept includes countertransference as well, which refers to the emotional attitude of the therapist to the patient. In the treatment of children, the countertransference is of the utmost importance. Contact with the child patient is close, and children, being suspicious and intuitive, invariably perceive the emotional attitude of the therapist and respond quickly to it, in either a positive or a negative fashion, since the child's problem is always one of love and frustration. The treatment of childhood problems demands considerably more of the therapist, emotionally, than does the treatment of adults, since in the former case the therapist's liking for the patient is important to therapy. (Perhaps the reason child therapists are few in number is that not many people have sufficient patience or empathy to cope with the situation over a long period.)

Strong subjectivity on the part of the child therapist is an indispensable part of treatment. Objectivity plays a much less important role than it does in the treatment of adults because the therapist is actually a substitute parent for the time being and the child can never accept an objective parent.

Freudian psychoanalysis has pointed out that the child's needs must be the focal point of the therapist's attention and he will frequently have to adjust his technique to those needs, as should the parents and teachers.

What therapy calls for, then, is the prevention of further conflicts, the ending of needless frustrations, and the provision of modes of gratification for the young patient at home and at school. In order to diagnose the case so that he will be oriented in his therapeutic approach, the therapist must have a comprehensive knowledge of the meaning of symptoms and behavior, of character traits, regressive tendencies, fixations, and developmental levels. His approach will be greatly facilitated if he is versed in the dynamics of psychiatry.

IMPAIRED CEREBRAL FUNCTIONS IN CHRONIC BRUCELLOSIS [1]

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It is currently commonplace to assert that brucellosis or undulant fever is characterized by protean manifestations(1-3). Clinical recognition of central nervous system involvement and of psychiatric reactions(4) in the course of the disease antedated Hughes' (5) recovery of the organism from the human meninges in 1897. In the first decade of this century, Cantaloube and Masselot(6) suspected brucellosis in the absence of cardinal symptoms when mental deterioration appeared in patients with recurrent fever. European investigators are chiefly responsible for descriptions of toxi-infective, schizophrenic, and depressive (7-11) reactions associated with chronic brucellosis as well as the clinical (7, 12-14) and neuropathological data(5, 18-23) which reveal that anatomical changes may occur in any subdivision of the nervous system. In this country, Hansmann and Schenken(24) and R. De Jong(25) were among the first to describe neurological complications in brucellosis. Harris (26, 27) has repeatedly stressed the need for distinguishing psychologically determined symptoms from the remainder of the complex clinical syndrome. Changes in personality are encountered so frequently in patients with chronic brucellosis that a psychiatric label is often appended to the primary diagnosis. Hardy's statement(28), "a quantitative measurement of symptoms so variable as those which result from deranged functioning of the psychic or neurological processes has not been possible," placed emphasis, therefore, on a problem as old as medical acquaintance with the disease.

Our attention was drawn to the psychophysical relations in chronic brucellosis when profound disturbances in the adaptive capacities of patients could not be adequately explained by medical findings and by appraisals of the basic personality structures. This presentation is based on studies of 10 patients with brucellosis [6] who were evaluated by the combined techniques of the internist, neuropsychiatrist, and experimental psychologist. By employing this correlative methodology, organic central nervous system involvement was distinguished from the psychoneurotic reactions and the pathoneuroses associated with chronic illness. Seven of the 10 patients exhibited clinical and laboratory evidence of organic brain disease although definitive neurological signs were elicited only in one patient (Summary 3). Table 1 contains the essential data.

The development by Halstead(29-33) of a battery of neuropsychological indicators upon which an impairment index of cerebral cortical functions and a concept of biological intelligence are based provided an instrument for differentiating the behavioral effects due to cortical damage from those independent of cerebral injury. Clinicians are familiar with the discrepancies between usable intelligence and measured IQ. Ackerly(34) and Brickner(35) recorded examples of this discrepancy in patients with extensive lesions of both frontal lobes. The validity of the impairment index, which is derived from 10 objective discriminating behavioral indicators, has been established by a detailed study of selected neurosurgical patients with known localized lesions of the brain. In addition,

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[6] In 8 patients, the diagnosis was bacteriologically proved by recovery of the causative organism; *Br. abortus* in 6, *Br. melitensis* in 1, and *Br. suis* in 1. For two patients (Summaries 3 and 4), bacteriological proof is lacking largely because of the long duration of illness (7 years and 3 years) before our examinations. Collateral evidence of infection is, however, convincing and is presented in the case summaries.

the battery consists of seventeen objective nondiscriminating indicators which provide essential control data so that the impairment index is applicable through a wide age range and considerable variations in educational background as well as in psychometric intelligence. A low impairment index (0.0—0.3) is interpreted as evidence of good biological intelligence, a conception more closely related to ego functions or the clinically observed capacities of the individual for general adaptive behavior than those measured by standard psychometric tests. On the other hand, a high impairment index (0.5 to 1.0) in the presence of normal scores on the control tests is interpreted as impairment of biological intelligence or disintegration of ego functions in the individual.

TABLE 1

SHOWING DISTRIBUTION OF 10 PATIENTS WITH BRUCELLOSIS ACCORDING TO SEX, AGE, ONSET OF ILLNESS, CAUSATIVE ORGANISM, HALSTEAD IMPAIRMENT INDEX, AND PSYCHIATRIC DIAGNOSIS

Patient	Sex	Age at examination	Onset of illness	Causative organism	Halstead impairment index *	Psychiatric diagnosis
G H	M	44 (4-25-47)	Nov., 1946	*Br. abortus*	0.2	Obsessional character
F G	F	51 (5-26-47)	Jan., 1941	.....	0.3	Depressive reaction
E F	F	30 (3-13-47)	Jan., 1947	*Br. abortus*	0.4	No diagnosis
D E	F	31 (9-18-47)	Oct., 1944	*Br. melitensis*	0.6	Organic brain reaction
H I	F	29 (11-26-47)	Dec., 1944	*Br. abortus*	0.6	Meningoencephalitis with transient hemiparesis
I K	F	24 (9- 2-47)	Dec., 1945	*Br. suis*	0.6	Organic brain reaction
K L	M	31 (6-10 47)	Mar., 1947	*Br. abortus*	0.7	Organic brain reaction
C D	F	50 (1-28-47)	Spr., 1937	.....	0.8	Meningoencephalitis
A B	M	29 (12- 6-46)	June, 1944	*Br. abortus*	0.8	Organic brain reaction
L M	M	54 (1- 5-48)	July, 1945	*Br. abortus*	0.8	Organic brain reaction

* Scores ranging from 0.0 to 0.3 are considered normal. The range between 0.5 and 1.0 denotes graded impairment of biological intelligence.

The following 4 summaries are designed to point up characteristic findings in the 10 patients studied by the combined medical, neuropsychiatric, and neuropsychological techniques.

SUMMARY No. 1.—Miss IK,[7] a 24-year-old divorced singer, has been observed periodically at the University of Chicago Clinics since September 1, 1947. She acquired brucellosis (*Br. suis* septicemia) in March 1945 while in the Navy working in a brucella research laboratory.

The acute phase of the illness was severe and prolonged and included episodes of intense headache and stupor suggestive of an encephalopathic process. In the succeeding 2 years the patient suffered from at least 10 febrile episodes. She has continued to complain of persistent fatigue, recurrent headaches, multiple joint pains, insomnia without somnolence, mental sluggishness, and poor memory. She was unable to recall dates of such personal events as graduation from high school, when she won a national singing contest, her marriage, and her divorce.

The past history revealed that she engaged easily in social relations and had a wide variety of interests. Although a gifted singer, she adjusted successfully to an entirely new military occupation. Mild characterological difficulties of a hysterical quality led her into an unsuccessful marriage which she terminated by divorce in 1944. Since discharge from the military service early in 1946, she has been unable to continue musical training because of her illness. Nevertheless, she went on a 2-month concert tour with a well-known orchestra in the fall of 1947, during which time her vocal control was uncertain. She has experienced neither sexual desire nor an enduring social contact in the past 3 years. Patterns of reaction during psychiatric interviews were characterized by reduced motility, inadequate emotional response, defective judgment

[7] Case No. 3 in Howe et al. (36).

and memory, inability to plan for the future, and failure to develop ordinary rapport.

Neuropsychological studies done in September 1947 revealed that Miss IK was cooperative in her attitude toward the examinations, a fact which was substantiated by performance within normal or superior limits on the control tests. However, on 6 of the critical tests which measure cortical impairment she made significantly positive scores. The Halstead impairment index of 0.6 denotes relatively severe deterioration of functions attributable to the prefrontal lobes of the brain. Reexamination in November 1947 yielded evidence suggestive of progressive deterioration.

SUMMARY No. 2.—Mr. AB, a 29-year-old Negro cattle-skinner, has been admitted to Billings Hospital 8 times since 1944 for chronic brucellosis. The diagnosis was established by recovery of *Br. abortus* from the blood stream during the acute phase of the disease and from an excised lymph node 2 years later. In spite of an excellent occupational record with a large packing company for 10 years, he has been unable to return to his work since the inception of the illness.

His first admission was 2 months after the sudden onset of an acute illness characterized by chills, high fever, sweats, cough, and a loss in weight of 30 pounds. Although seriously ill, he was well oriented and alert and displayed appropriate affective responses. During the subsequent 3-year period of observation, which included many hospital admissions, he remained afebrile but presented many vague complaints. It became apparent to the attending staff that the patient was undergoing progressive mental and emotional deterioration. He became listless, apathetic, and at times almost stuporous. Replies to simple questions were delayed and inconsistent. In response to the question, "How do you feel?" he asserted, "I just don't feel good," and was unable to elaborate on or define his disability. He continued to be cooperative in a passive manner, making no demands upon the medical and nursing staffs. He was referred for psychiatric and psychological evaluations.

The patient moved slowly with a minimal expenditure of effort; his facial expression rarely changed. He expressed a vague optimistic attitude regarding possibilities for complete recovery and eventual return to work but had no precise plans for future activities. His compensation for disability, which was one-fifth of his former earning capacity, had been suspended for several months during 1946 and 1947 but he expressed no feelings of resentment or impatience. He admitted that there had been a sharp decrease in his sexual appetite since 1944. He spent the major portion of his days at home talking to his wife, listening to the radio, reading, and resting. He noticed a leveling off of mood swings. Noises irritated him more than previously. He responded slowly and erratically to the standard tests for immediate recall, memory, and calculation. On repeated neuropsychological examinations during 1946, 1947, and 1948 this patient was found to be cooperative. His interest and motivation were sustained throughout. On control tests of the major battery, his scores were within normal limits. However, he obtained an impairment index of 0.8, which is compatible with damage to or even surgical removal of both prefrontal lobes in man.

SUMMARY No. 3.—Mrs. CD, a 50-year-old farmer's wife, has been examined at frequent intervals at the University of Chicago Clinics since November 1944. The present illness began in 1938 with headache, muscular pains, loss of weight, and fluctuations in temperature between 96° and 104°. Although bacteriological proof has not been obtained in this patient since she first came under our observation 7 years after the onset of her illness, the diagnosis of chronic brucellosis rests soundly upon the following data: an adequate exposure history consisting of ingestion of raw milk from a herd known to be heavily infected with Bang's disease; a rising agglutinin titre from completely negative at the onset of the illess to a titre of 1/320 several months later (both tests were done in the Illinois State Laboratory of Public Health); and a chronic febrile incapacitating illness in a previously well patient. Her past history revealed that she had been able to accept changing relationships in wholesome accordance with the potentialities of each situation. Persistent complaints included headache, weakness, fatigability, insomnia without somnolence, and radicular pains. For the past 7 years she has recognized increasing difficulties in reading, writing, calculating, and remembering. Sample tests for immediate recall, memory, and calculation yielded retarded and impaired responses. The neurological findings in 1946, 1947, and 1948 included unequal pupils, perioral and lingual tremors, muscular atrophies and pareses, sensory disturbances and reflex changes. Spinal fluid studies on 4 occasions revealed no biological alterations. Electroencephalographic tracings taken a year apart were consistent with generalized encephalopathy.[8] These findings led to a diagnosis of meningoencephalomyeloradiculoneuritis associated with chronic brucellosis.

This patient failed to obtain criterion scores on 8 of the 10 critical tests and had an impairment index of biological intelligence of 0.8. On the other hand, responses to the control tests were within normal limits.

SUMMARY No. 4.—Mrs. FG,[9] a 51-year-old divorcee, has had 5 hospital admissions since February 1944. She reported that in 1941, following a vacation on a farm in Michigan where she drank raw milk, she developed an illness characterized by fatigue, night sweats, a 20-pound weight loss, and fever which persisted for 9 months. She received 6 injections of vaccine (Brucellin); the last was given in 1943. There were 3 severe recurrences of fever, the last one in 1944 when she was hospital-

[8] We are indebted to Dr. Theodore J. Case for these interpretations.

[9] Case No. II in reference 1.

ized for 6 weeks. In 1945, an osteomyelitis, presumably due to localized brucella infection, developed in the 4th and 5th lumbar vertebrae resulting in collapse of the bodies of these vertebrae and gibbous formation which required surgical fusion.

The diagnosis of brucellosis in this patient was not bacteriologically proved although numerous blood cultures were taken. The diagnosis rests upon the following: a history of consuming raw milk shortly before the onset of her illness; a recurrent severe febrile illness; a persistently high, fluctuating agglutination titre, reaching a peak of 1/5,120 six years after the onset and four years after the last injection of vaccine; recurrent erythema nodosum; recurrent corneal ulcers; a high degree of allergy to Brucellergen (reaction to 1/1,000,000 dilution) and destructive vertebral lesions identical with those caused by brucella in man and animals.

Although clinical and roentgenologic evidence of activity in the lesions ceased following the operation for spinal fusion, the patient required hospitalization throughout the major portion of 1946. During this period she presented a variety of complaints which were subsumed under the label of "hysterical reaction." Psychiatric examination in May 1947 revealed that she was basically a guilt-ridden personality who, prior to the onset of brucellosis, had experienced several neurotic depressive reactions.

In 1947 the experimental psychologist commented that this 51-year-old woman was quite cooperative throughout the neuropsychological examinations. Although she complained of some impairment of memory, no signs of loss were apparent in her performances. A formal IQ of 125 was obtained. Her impairment index as based upon the discriminating tests was found to be 0.3. Her response on one of the projective personality tests satisfied the criteria for a mild depressive reaction.

This case is included to illustrate that psychosomatic and hysterical complaints may develop and become exaggerated during the course of chronic brucellosis as in other chronic diseases. It is significant that the patient failed to show impairment of cerebral functions on the Halstead impairment index, which serves to corroborate the validity of these tests in differentiating the functional from organic lesions.

DISCUSSION

Behavioral changes, especially symptoms of a psychoneurotic nature, have long been recognized as an important and often a predominant part of the clinical picture in brucellosis. This feature of the disease combined with the lack of strict diagnostic criteria has led to extensive confusion. Many patients with brucellosis have been labeled psychoneurotic. The converse has been equally true, namely, patients with neuroses have been diagnosed and treated for brucellosis, a disease which many of them do not have. The observation by the internists of behavioral changes and intellectual deterioration in some of the patients presented here led to this combined investigation. Prior psychiatric and psychologic methods have been nondiscriminating in separating functional behavioral patterns from those due to organic brain disease. The Halstead battery of tests for estimating biological intelligence and its correlation with clinical observations provides an effective method for this differentiation.

The present study reveals that patients with brucellosis with severe personality changes may also have a measurable impairment of biological intelligence. The degree of impairment for some is comparable to that seen in patients with surgical removal of the prefrontal lobes of the brain.

The clinical patterns in the first 3 summaries presented reveal measured impairment of biological intelligence and a deterioration of adaptive capacities or ego functions. The equivalence of biological intelligence and ego functions is more readily appreciated when ego is recognized as referring "to the organ system whose anatomical and physiological substratum is made up of the highest integrative centers of the central nervous system" (37). Evidence for disturbances in ego functions can be obtained by several methods. In this study, 3 methods were used concurrently: the clinical psychiatric, by which changes in social relations were evaluated in respect to the basic personality structure; the neuropsychological, by which biological intelligence was quantitatively estimated; and the internists' evaluation, by which the primary diagnosis was established and the possibility rendered remote of other concurrent diseases being responsible for the observed brain damage.

The modifications of personality varying from vague and shifting complaints to disruption of behavioral patterns have retarded our understanding of brucellosis. Minor symtoms which are initially determined by pathological anatomical changes may be utilized by the individual as a nucleus of a psychoneurotic reaction. However, the patients with chronic brucellosis who have deficiencies in biological intelligence may present a clinically

distinguishable picture. They complain of headache, easy fatigability, inability to return to work, loss of former skills, insomnia without somnolence, and decreased ability to adapt in social situations. Their psychiatric state is characterized by defects in the intellectual sphere, impoverished emotional expression, reduction in motility, inability to plan for the future, and failure to establish ordinary rapport.

The presentation of this syndrome compels mention of Goldstein's formulation(38) regarding changes in psychological functions in patients with organic brain disease and in schizophrenic patients. In addition, the failure to develop ordinary rapport is highly reminiscent of the traumatic neuroses. That chronic debilitating disease is not responsible for impairment of biological intelligence is illustrated by the fourth summary in this report. Furthermore, in our experience projective techniques including the Rorschach test, while providing suggestive leads in some of the cases, are nondiscriminating from the standpoint of organic brain disease.

While 7 of the 10 patients in this series of cases present evidence of organic brain disease, we do not presume that this indicates in any sense the incidence of this complication. Furthermore, the critical tests used in this study primarily measure the functions of the frontal lobes. We do not presuppose that brain damage in brucellosis is confined to this area. On the contrary, neuropathological studies(18-24) indicate that there may be diffuse involvement of the cerebral cortex in brucellosis.

CONCLUSIONS

Combined medical, psychiatric, and experimental psychological techniques provide correlative and corroborative data which indicate that cerebral impairment occurs in some patients with brucellosis. Damage to the cerebral cortex may explain many of the symptoms and changes in behavorial patterns in these patients.

A syndrome of organic brain disease associated with chronic brucellosis is described.

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VERBAL HALLUCINATIONS AND ACTIVITY OF VOCAL MUSCULATURE

An Electromyographic Study [1]

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INTRODUCTION

The auditory hallucination in schizophrenia has been regarded by many as a fundamental symptom(1). Although this may be disputed, there is no doubt that it occurs with great frequency and exerts a profound influence on the mental life and behavior of the patient. The theory that it is an external projection of intensified ideas has been replaced by the explanation that it represents automatic activity of a central intellectual process(2). In any event, it is the involvement of the thought process and its motor component that is germane to the present investigation. Thought has been characterized as a mode of movement involving the organ of speech(3). This theory, first proposed following subjective observation, was later confirmed by mechanical and electrical methods(4-9).

Involvement of the speech mechanism in auditory hallucinations has been known but has not been sufficiently emphasized. Baillarger related the frequency of auditory hallucinations to the close connection between articulating sounds and the higher centers of intelligence(10). In 1897, Edmund Parrish stated that the greater number of the voices, if not all, were caused by automatic speech on the part of the percipient (11). In 1935, Lagache investigated the question as to whether verbal hallucinations were really disorders of language and whether the language of the patient was misinterpreted and disguised under the aspect of strange speech(12). More recently Jonathan Lang, a patient, reported his "thoughts-out-loud" accompanied by a "minimal tonus of the vocal muscles"(13, 14).

In a recent article, the writer described the study of the sub-vocal speech of a schizophrenic who was experiencing verbal hallucinations(15). The motor component was exemplified not only as a faint whisper and as a movement of the floor of the mouth, but also as a sustained increase of vocal muscle potential in the electromyogram.

This paper is a report on the electromyographic study of the vocal musculature of patients who were hearing "voices," for the purpose of determining a possible relationship between verbal hallucinations and the psychomotor mechanism of speech.

METHOD

A patient group of 100 was selected to include those actively hallucinating, cases not hallucinating, cases unknown as to presence of hallucinations, and a group of 17 taken in alphabetical order from the ward census of one of the continued treatment services.[2] With the latter exception, no attempt was made to control the number in each group.

One hundred controls were obtained from hospital personnel and students, including one physician, graduate and affiliate nurses, attendants, and theology and psychology students. As with the patient group, no selection was made according to age or sex.

A Rahm electroencephalograph, calibrated at 9 mm. = 50 mv. and 3 cm. = 1 sec., was employed. Two leads placed on the lower lip and chin, 2 cm. apart in the midline, were utilized to obtain muscle potential from the vocal organs(7). The 5 remaining channels were used to record simultaneous cortical activity and muscle tension of other areas (eye, jaw, larynx, biceps, etc.).

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With technical assistance of Mrs. Alice Donahue and Mr. Alexander Cudo.

The author wishes to acknowledge gratitude to Dr. Charles Krinsky, chief of the electroencephalographic laboratory, and to Dr. Riley H. Guthrie, superintendent, for permission to use the facilities of the laboratory, and also to Dr. Hermann Schmidt, Ph.D., for his statistical study.

[2] Hereafter, for convenience, verbal hallucinations will be usually referred to as hallucinations.

This report concerns only the activity of the vocal musculature.

No person tested, whether patient or control, was aware of the purpose of the investigation. The subject was told that it was "something like a brain wave test." He was placed on a rigid cot as for an EEG, was asked to close his eyes, the lights were turned off, and a brief run was made varying from 6 to 18 sec.

As each tracing was obtained, the predominating potential was measured and tabulated.[3] A flat or wavy line, with no or with very few muscle spikes, or one with spikes less than 1 mm. in height (5.5 mv.) was listed as "no muscle potential" (Fig. 1). All sustained potentials larger than this were considered to indicate increased muscle activity (Fig. 2).

FIG. 1.—Electromyogram of vocal musculature of a patient (C. O.) not experiencing verbal hallucinations.

FIG. 2.—Electromyogram of vocal musculature of a patient (C. N.) experiencing verbal hallucinations.

Potentials of 80 to 100 mv., although probably produced by tension in the jaw, were included because of possible masking of vocal organ tension.

Potentials of the entire patient group having been recorded, the case records were then thoroughly reviewed. Notation was made of all references to verbal hallucinations, including the investigator's current knowledge of any particular patient, and a decision reached as to presence or absence. When a recent progress note made no mention, or stated that the patient was unable or unwilling to admit hearing "voices," balancing of affirmations against denials, as gathered from study of the record, permitted in many cases a definite decision to be reached. This was not too difficult as many patients hallucinated for years. Where doubt still remained, the notation was made, "probably hallucinating," or "probably not hallucinating."

Comparison of the percentage of hallucinating patients in this group with the 60-80% reported in the literature served as a check on the judgment of the investigator (2). Accordingly, it was found that out of 72 patients with schizophrenia, 56 (77%) were hallucinating or were probably hallucinating.

The decision in each case with regard to occurrence of hallucinations was recorded opposite the corresponding muscle potential measurement.

RESULTS

In the control group of normals there were 28% with increased potential (Table 1), whereas in the patient group there were 58% with increased potential (Table 2).

Using the figures obtained from Table 3, we found that 40 of 48 patients experiencing auditory hallucinations (83%) had increased potential of the vocal musculature. Of the combined group of 64 having or probably having hallucinations, 53 (82%) had increased potential of the vocal musculature.

The nonhallucinating group of patients served as an additional control (Table 3). Of the 33 patients not experiencing auditory hallucinations, 30 (90%) had no increase of muscle potential. Of the combined group of 36 patients not experiencing hallucinations or probably not experiencing hallucinations, 31 (86%) showed no increase of muscle potential.

In the group of schizophrenics there were 56 who were hallucinating or probably hallucinating. Of these, 45 (80%) had an increase of vocal muscle potential.

DISCUSSION

It was interesting to obtain graphic confirmation of common knowledge that a number of normal people have tension in the "throat." The fact that the patient group had a much higher percentage showing increased potential of the vocal organs was due, it seems, to the presence of auditory hallucinations (Table 4).

[3] Wave frequency and potential are both increased during muscle activity. Only the potential was utilized in this investigation as an index of muscle tension.

TABLE 1

Normal Population

Subject No.	Microvolts	Subject No.	Microvolts	Subject No.	Microvolts	Subject No.	Microvolts
1	0	26	16.5	51	0	76	0
2	0	27	22.0	52	0	77	0
3	0	28	22.0	53	27.5	78	0
4	0	29	0	54	0	79	0
5	0	30	16.5	55	0	80	0
6	11.0	31	16.5	56	0	81	0
7	0	32	0	57	0	82	0
8	16.5	33	0	58	0	83	22.0
9	22.0	34	0	59	27.5	84	22.0
10	11.0	35	16.5	60	0	85	0
11	22.0	36	0	61	0	86	0
12	0	37	16.5	62	0	87	0
13	27.5	38	16.5	63	0	88	0
14	82.5	39	0	64	0	89	0
15	44.0	40	0	65	0	90	11.0
16	0	41	0	66	0	91	0
17	0	42	0	67	16.5	92	0
18	0	43	11.0	68	0	93	0
19	0	44	0	69	0	94	16.5
20	0	45	0	70	0	95	0
21	0	46	0	71	0	96	0
22	0	47	0	72	22.0	97	0
23	0	48	11.0	73	0	98	22.0
24	0	49	0	74	27.5	99	0
25	0	50	0	75	0	100	0

TABLE 2

Patient Group

Case No.	Hall.	Microvolts	Case No.	Hall.	Microvolts	Case No.	Hall.	Microvolts	Case No.	Hall.	Microvolts
1	+	33.0	26	0	0	51	0	0	76	+	38.5
2	+?	0	27	0	0	52	0	0	77	+	16.5
3	+	11.0	28	+?	11.0	53	+	0	78	+	0
4	+	50.0	29	+	16.5	54	0	0	79	+	11.0
5	+	50.0	30	0	0	55	+	11.0	80	0	0
6	+	27.0	31	0	0	56	0	0	81	0	0
7	+	55.5	32	0	0	57	0	0	82	0	16.5
8	+	20.0	33	+?	0	58	0	0	83	+	22.0
9	+?	38.5	34	+	0	59	0	0	84	+?	11.0
10	+	27.5	35	+	27.5	60	+	0	85	0?	11.0
11	+	0	36	+?	50.0	61	+	27.5	86	+?	100.0
12	+	27.5	37	0	0	62	+	33.0	87	0	0
13	+	38.5	38	0	0	63	+?	16.5	88	+	11.0
14	+?	11.0	39	0	0	64	+?	16.5	89	+	16.5
15	0	0	40	0	0	65	0	0	90	+?	27.5
16	0	0	41	0	0	66	0	0	91	0	0
17	0	0	42	0?	16.5	67	+	27.5	92	0	11.5
18	0	0	43	+?	16.5	68	+?	5.5	93	+	0
19	0	0	44	+	27.5	69	+	11.0	94	+	16.5
20	+	22.0	45	+	16.5	70	+	27.5	95	+	22.0
21	0	0	46	+	0	71	+	22.0	96	+	50.0
22	+	16.5	47	0	0	72	+	100.0	97	+	16.5
23	+?	0	48	0	27.5	73	+?	82.5	98	+	16.5
24	+	0	49	0	0	74	+	27.5	99	+	27.5
25	+?	16.5	50	+	27.5	75	+	27.5	100	+	16.5

Explanation of Symbols:

+ indicates presence of hallucinations.
o indicates absence of hallucinations.
+? indicates probably hallucinating.
o? indicates probably not hallucinating.

TABLE 3

TABULATION ACCORDING TO DIAGNOSIS

Diagnosis	No. of cases	Hall.	Hall. with incr. pot.	Prob. hall.	Prob. hall., incr. pot.	Hall., no incr. pot.	Prob. hall., no incr. pot.	Not hall.	Not hall., no incr. pot.	Prob. not hall.	Prob. not hall., no incr. pot.	Not hall., incr. pot.	Prob. not hall., incr. pot.
Schizophrenia													
Paranoid	40	25	20	8	6	5	2	6	6	1	0	0	1
Hebephrenic	12	8	8	2	1	0	1	2	2	0	0	0	0
Catatonic	9	4	3	1	1	1	0	3	3	1	1	0	0
Simple	5	2	1	1	1	1	0	2	1	0	0	1	0
Undetermined	6	1	1	4	4	0	0	1	1	0	0	0	0
Involutional psy.													
Melancholia	3	1	1	0	0	0	0	2	1	0	0	1	0
Paranoid	1	1	1	0	0	0	0	0	0	0	0	0	0
Acute and chronic alcoholism	1	0	0	0	0	0	0	1	1	0	0	0	0
Alcoholic psy.													
Delirium tremens *	4	1	1	0	0	0	0	3	2	0	0	1	0
Paranoid	1	0	0	0	0	0	0	1	1	0	0	0	0
Korsakoff's	1	0	0	0	0	0	0	1	1	0	0	0	0
Deterioration	2	1	1	0	0	0	0	1	1	0	0	0	0
Psychosis with cereb. arterioscl.	2	1	0	0	0	1	0	1	1	0	0	0	0
Senile psychosis													
Simple	1	1	1	0	0	0	0	0	0	0	0	0	0
Paranoid	2	1	1	0	0	0	0	1	1	0	0	0	0
Psy. syphilitic meningo-enceph.	2	1	1	0	0	0	0	0	0	1	0	0	1
Psy. with convul. disorders, epil.	1	0	0	0	0	0	0	1	1	0	0	0	0
Psychosis with mental deficiency	2	0	0	0	0	0	0	2	2	0	0	0	0
Psychosis with postencephalitis	1	0	0	0	0	0	0	1	1	0	0	0	0
Manic dep. psy. manic	1	0	0	0	0	0	0	1	1	0	0	0	0
Psychoneurosis	3	0	0	0	0	0	0	3	3	0	0	0	0
Totals	100	48	40	16	13	8	3	33	30	3	1	3	2

* Recovered.

Why in the nonhallucinatory group of patients the number with increased tension was smaller (14%) than in the control group (28%) is unknown. It can be speculated that patients who hallucinate are the types of personalities who retain to a greater degree the habit of muscular accompaniment to thinking. Or perhaps they have a greater liability to emotional reenforcement of muscular activity of the vocal organs.

Research has been directed almost exclusively toward the sensory aspects of the hallucinatory experience. The psychomotor component also plays an important rôle. It is the writer's opinion that the activity of the vocal musculature is an essential factor in the production of a type of automatic speech which is more or less audible only to the patient (except under experimental conditions) and is misinterpreted as a "strange voice." Evidence in support of this theory and statement of its therapeutic implication will be submitted in a forthcoming paper.

TABLE 4

CALCULATION 2/

Auditory hallucinations	I. M. P. Pos.	I. M. P. Neg.	Totals
Present	53	11	64
Absent	5	31	36
Totals	58	42	100

From the above 2 x 2 table, it is obvious, even by inspection, that subjects who were hallucinating (or probably were hallucinating) showed an increase in muscle potential, while those subjects who were not hallucinating (or probably were not hallucinating) showed no increase in muscle potential. Chi-square (corrected for small numbers) equals 47.3, for which P is considerably less than .01. We can safely conclude from this that there is a significant relationship between hallucinations and increased muscle potential; *i. e.*, that hallucinations and increased muscle potential of this group of patients were not independent. The data do not permit us to say off-hand that there is a cause-effect relationship, that hallucinations *affected* muscle potential.

An electromyogram of the vocal organs appears to offer a laboratory method for determining the presence or absence of verbal hallucinations. It would also be of value in confirming symptomatic improvement, particularly in schizophrenia. Reduction of tension under various types of treatment could be graphically portrayed as, for example, in music therapy.

Preliminary work with simultaneous leads to different muscle groups revealed interesting tension patterns. It is suggested that this method be employed for study of tension states, particularly in psychotics.

SUMMARY

1. The demonstration of increase of muscle potential of the vocal organs in a case of schizophrenia experiencing verbal hallucinations suggested further investigation. Accordingly, electromyograms of the vocal musculature were obtained from 100 patients and 100 normal controls by means of an electroencephalograph machine.

2. Forty of a group of 48 patients experiencing verbal hallucinations (83%) had increased potential. Of a combined group of 64 having or probably having auditory hallucinations, 53 (82%) had increased potential.

3. Of the group of 33 patients not experiencing hallucinations, 30 (90%) had no increase of muscle potential. Of the combined group of 36 not experiencing or probably not experiencing hallucinations, 31 (86%) showed no increase of muscle potential.

4. In the group of 56 schizophrenic patients who were hallucinating or probably hallucinating, 45 (85%) had an increase of muscle potential.

5. Tension in the "throat" exists in 28% of a sampling of the normal population, whereas it is present in 58% of a sampling of patients in a mental hospital.

6. Hyperactivity of vocal musculature in the psychotic appears related to the presence of verbal hallucinations.

7. The electromyogram of the vocal musculature offers a laboratory method for determination of presence of verbal hallucinations and for the graphic portrayal of change of tension following treatment.

8. A theory of verbal hallucinations is tentatively reaffirmed concerning involuntary intensification of the psychomotor mechanism of speech.

9. A study of muscle tension patterns by means of simultaneous electromyograms is suggested.

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FATALITIES RESULTING FROM TREATMENT WITH SUBSHOCK DOSES OF INSULIN[1]

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The use of insulin in subshock doses has been advocated in the treatment of nervous and mental disorders in the past decade. The object has been to produce with the administration of small doses of insulin a state varying from drowsiness to one just bordering on coma in order to achieve the desired therapeutic effect. But while in the great majority of cases no complications occurred, occasional "untoward insulin effects" have been observed by many investigators. Thus convulsions were reported in 35 out of 332 cases of various psychoses by Sullivan(1), in 3 out of 65 cases of anxiety state by Bloss and Auer(2) and in 3 out of 43 cases of acute alcoholism by Vassof and Hall(3), while Thimann and Peltason(4) noted a tendency to develop convulsions in their treatment of acute alcoholic psychoses. In spite of these complications, however, no casualties have been reported until recently when one fatality occurred in Sullivan's series of 332 cases. The pathoanatomic findings of this case and of a case of delirium tremens form the basis of this report for the purpose of drawing attention to such seemingly unexpected complications.

REPORT OF CASES

Case I.—*Clinical Summary.*—M. J. M., a white soldier, aged 21, became acutely psychotic on July 15, 1945, while on overseas duty. He was reported to be overactive, confused, and had flight of ideas. He was evacuated to this country and admitted on July 28 to a hospital where a course of 6 electroshock treatments resulted in considerable improvement. He was then transferred to a hospital for convalescent care where he maintained his improvement until August 22. On that day he suffered a relapse characterized by overactivity, negativism, auditory and visual hallucinations. The diagnosis was acute psychosis, unclassified, probably schizophrenia. It was decided to give him a course of insulin subshock treatments, the preparatory physical examination and laboratory studies being essentially negative.

The treatments were started on August 23 with an initial dose of 30 units, which was gradually increased by 5 units twice a day, so that, when the treatments had to be terminated on August 26, the patient had received a total of 7 injections consisting altogether of 315 units. On August 26, 55 units were administered at 7:00 a.m. without complications, and 60 units at 1:00 p.m. Fifteen minutes later the patient suddenly went into shock characterized by sweating, cyanosis, rapid feeble pulse, and marked restlessness followed by coma. Immediate administration of ½ c.c. adrenalin intramuscularly and oxygen by mask followed by 75 c.c. of 25% glucose intravenously during the first 1½ hours resulted in return of pulse to normal quality, but the coma persisted. Shortly afterwards Jacksonian seizures developed in the extremities of the left side followed by opisthotonos in which the left side of the body was held in extension. At 6:30 p.m. 60 c.c. of 50% glucose were administered intravenously. Nevertheless, the patient developed status epilepticus which was finally controlled by intravenous sodium phenobarbital. At 9:15 p.m. the patient was still in deep coma, the corneal reflex was absent, the pupils reacted sluggishly, the extremities were rigid and held in extension with the feet in plantar flexion, the deep tendon reflexes were diminished and there were bilateral Babinski signs. The temperature rose to 102.4° F., pulse to 120 beats per min., and respiration to 30 per min. The level of sugar in the blood was 48 mgs. %. During the night 175 c.c. of 50% glucose were administered intravenously and 1,000 c.c. of 5% glucose started. On the morning of August 27, the patient was still in coma with signs of decerebrate rigidity and the temperature remained elevated. The blood sugar level was now 165 mgms. % and a few hours later was 200 mgms. %. Nonprotein nitrogen was 46 mgms. %; urea nitrogen 19.5 mgms. %. Blood count revealed 5,350,000 erythrocytes and 14,400 leukocytes per c.mm., of which 78% were polymorphonuclear neutrophils and the rest lymphocytes. X-ray examination revealed signs of pneumonia in the right lung. During that day as well as on August 28 the condition of the patient remained essentially unchanged and administration of intravenous 5% glucose was continued. A spinal puncture revealed a clear fluid under pressure of 490 mms. of water. The temperature became increasingly more elevated in spite of treatment with penicillin, rising terminally to 107° F. Death occurred on August 28 at 11:45 p.m., the duration of the coma being approximately 60 hours.

Necropsy.—This was performed nine hours after death. The essential findings in the organs were bilateral bronchopneumonia, generalized congestion and edema, and fatty degeneration of the liver. The brain weighed 1,500 gms. and was edematous. The leptomeninges were congested, the blood ves-

[1] From The Langley Porter Clinic, San Francisco, Calif.

sels were delicate and engorged. On section there were scattered petechial hemorrhages in the gray matter.

Microscopic Examination of the Brain.—In Nissl preparations the cerebral cortex showed widespread degenerative changes. There was severe disintegration of the parenchyma which followed a pseudolaminar pattern. The upper layers were almost entirely destroyed with the exception of a zone of relatively preserved ganglion cells adjacent to the internal granular layer, which was intact while the lower layers were diffusely rarefied (Fig. 1A). Within the degenerated layers, the neurons had almost completely dropped out, the few remaining nerve cells being shrunken forms with pyknotic nuclei, pale or hyperchromatic cytoplasm undergoing chromatolysis, and frequent incrustations. The neuroglia were equally degenerated. There was a diffuse proliferation of microglia in the form of hypertrophic, branching, and rod cells (Fig. 1B). The endothelium of the small blood vessels and capillaries of the cortex was markedly swollen (Fig. 1B); the larger vessels were congested but not thrombosed and were only occasionally surrounded by petechial hemorrhages. In Van Gieson preparations there was a striking spongy state of the ground substance either in the form of empty vacuoles or enclosing shrunken neurons (Fig. 1C). Fat and myelin preparations were negative.

The above changes were fairly uniformly distributed throughout the gray matter of the frontal, temporal, parietal, and occipital lobes, but showed local variations in the number of layers involved and differences in intensity from total disintegration to diffuse rarefaction. There was particularly severe bilateral involvement of Ammon's horn with selective degeneration of Sommer's sector. There was moderate diffuse degeneration of neurons and proliferation of microglia in the caudate and putamen, but there were no distinct changes in the cerebral white matter, globus pallidus, thalamus, hypothalamus, brain stem, cerebellum, and spinal cord.

Case II.—*Clinical Summary.*—C. E., a white male, aged 39, was admitted to the hospital on August 1, 1946, with a history of chronic alcoholism and acute onset of mental symptoms 9 days before admission. Physical examination was essentially negative. Temperature was 99° F., pulse rate 86 beats per min., respirations 20 per min., blood pressure 132 systolic and 80 disastolic. Mentally, the patient was disoriented and restless, expressing visual hallucinations. Neurologically there were tremors of the tongue and hands, slight incoordination, and a positive Romberg sign. The diagnosis was acute alcoholic psychosis, delirium tremens.

On August 2 at 10:00 a.m., the patient was injected with 50 units of insulin intravenously and was given at the same time glucose, paraldehyde, and Vitamin B by mouth. He immediately lapsed into stupor which rapidly progressed to semicoma. He was treated with 1 c.c. of adrenalin intramuscularly and intravenous 50 % glucose followed by 1,000 c.c. of 10% glucose. During the day, however, the coma became deeper. On August 3, the patient still remained in deep coma and at this time the temperature was 103.2° F., pulse 102 beats per min., respirations 50 per min., and signs of pneumonia were becoming apparent. From August 3 to August 5, he was given a course of treatment consisting of 5 doses of 20 units of insulin buffered by 1,000 c.c. of 5% glucose as well as penicillin, cardiac stimulants, vitamin B, and oxygen. His condition, however, remained essentially the same and he was never roused from coma. The temperature rose progressively to 107° F. terminally, and he died on August 5, approximately 75 hours following the onset of coma.

Necropsy.—This was performed one hour after death and the essential findings in the internal organs were bilateral bronchopneumonia, generalized congestion and edema. The brain weighed 1,285 grams and aside from moderate edema and congestion, showed no gross changes.

Microscopic Examination of the Brain.—Nissl preparations disclosed extensive degeneration of the gray matter, similar to that of Case I but involving in this instance predominantly the cortex of the temporal and frontal lobes, and the corpus striatum. In the most severely affected cortical areas there was disintegration of both the upper and lower layers, only the internal granular layer and the cells adjacent to it being relatively spared (Fig. 2A). In more moderately involved regions, either supra- or infra-granular layers showed signs of degeneration, predominantly the upper laminae. Within the degenerated areas the neurons had either entirely disappeared or showed signs of shrinkage and liquefaction while the neuroglia were similarly involved. There was active microglial proliferation in the form of hypertrophic branching and rod cells particularly in the vicinity of the pia and the blood vessels. Occasionally, perivascular spaces of the latter contained rows of compound granular corpuscles, some of which showed mitotic figures (Fig. 2B). The blood vessels, particularly the capillaries, were congested and their endothelium was swollen. In Van Gieson preparations a diffuse spongy state pervaded the degenerated cortex (Fig. 2C). There were no changes in the fat and myelin preparations.

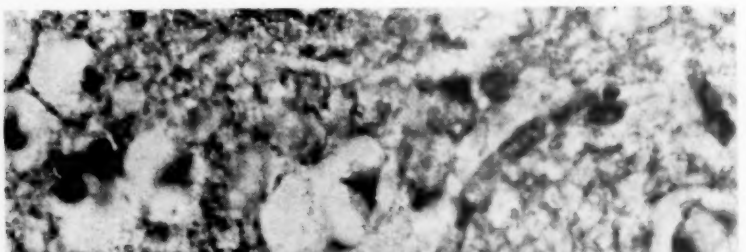
The maximum changes occurred in the temporal lobes where the cortex was almost entirely destroyed. In the cornu Ammonis, Sommer's sector was completely degenerated. In the frontal lobes, the cortex of the cingulate gyrus was most severely involved; that of the prefrontal region showed alternating areas of severe to moderate involvement, while the precentral cortex was least affected. Only mild changes were encountered in the island of Reil and parieto-occipital regions. In the basal ganglia, there was severe degeneration of almost the entire caudate nucleus with the exception of regions bordering on the ventricle and the internal capsule. The putamen was severely affected in its rostral part. In the striate body the small neurons were more severely involved than the large, but the glial and vascular changes were similar to those of the cortex. The cerebral white matter, thalamus, globus pallidus, hypothalamus, brain

C. Cerebral cortex showing spongy state. × 260. Hematoxylin Van Gieson stain.

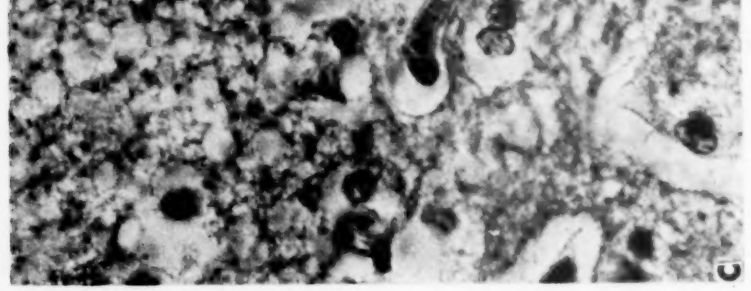
B. Proliferation of microglia and swelling of vascular endothelium within degenerated areas. × 470. Nissl stain.

A. Cerebral cortex, showing severe degeneration of upper layers, diffuse rarefaction of lower layers. × 30. Nissl stain.

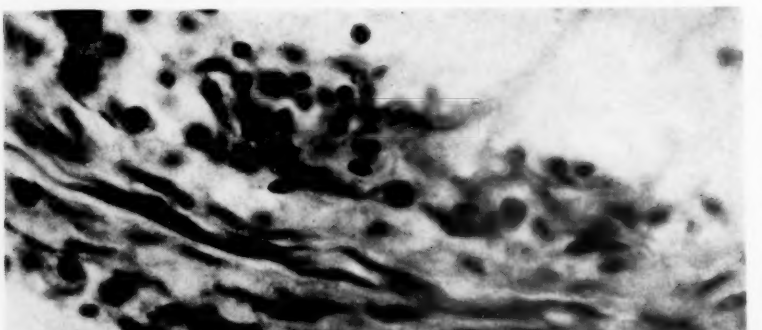
FIG. 1 (CASE 1).



C. Spongy state of cerebral cortex. × 470. Hematoxylin Van Gieson stain.



B. Compound granular corpuscles in perivascular spaces and proliferated microglia in surrounding tissue of degenerated cortex. × 470. Nissl stain.



A. Cerebral cortex showing pseudolaminar pattern of degeneration in upper and lower layers. × 30. Nissl stain.

FIG. 2 (CASE 2).

stem, cerebellum, and spinal cord were entirely spared.

DISCUSSION

Clinical Features.—In the two cases above described typical irreversible insulin reactions occurred—in Case I characterized by coma, convulsions, and decerebrate rigidity, and in Case II by protracted coma. The duration of the fatal episode was 60 and 75 hours respectively, terminating in pneumonia in both instances. Although fatal complications following use of coma doses of insulin are well known, the unique feature in our cases was the production of similar effects with the use of small subcoma doses of insulin. In Case I the maximum dose was 60 units and the cumulative total dose 315 units. In Case II a single dose of 50 units was sufficient to precipitate the incident, although it was followed later by another 100 units. In the first case, in spite of attempts to relieve the hypoglycemia, the symptoms remained unaltered, while in the second case the condition may have been further exacerbated by the use of additional small doses of insulin although at all times buffered by simultaneous administration of glucose. Such unexpected complications resulting from the administration of generally considered innocuous doses emphasize the variable reactions to insulin in different individuals, ranging from undue sensitivity as in our cases to high tolerance in others. Experimentally, Finley and Brenner(5), Weil et al. (6), demonstrated a direct proportionate relationship between irreversible reactions and duration of coma or dosages of insulin. This, however, does not seem to apply to human cases. Thus Rivers and Rome(7) in their analysis of cases of prolonged insulin coma emphasized the individual factor since neither the duration of stupor before administration of sugar, the maximum or cumulative dose of insulin, nor any other measurable factors seemed to play a role. Such a contention is borne out particularly by our cases where irreversible coma set in immediately following the administration of small doses. It may be contended that alcoholism was responsible either partly or wholly for the reaction in the second case. This is doubtful since the pathoanatomic findings in the latter case were identical with those of Case I, and had nothing in common with such changes as are described in acute or chronic alcoholism.

Pathoanatomic Features.—The pathologic changes in the nervous system were remarkably identical in the 2 cases, denoting a common pathogenesis. The lesions were located in the cerebral cortex and striate body, consisting of diffuse disintegration of the parenchyma with a pseudolaminar distribution in the cortex, while microglial proliferation and vascular endothelial swelling occurred secondarily. These findings are similar in all respects to those reported by Ferraro(8) and other authors in fatal complications following regular insulin shock therapy. They are also identical with the changes produced experimentally by Finley and Brenner(5). The severe edema amounting to a spongy state noted in our cases emphasizes that feature observed by Hassin(9), Yannet(10), and others.

There is no doubt, therefore, that insulin was responsible for the pathoanatomic changes in our two cases. However, analysis of the morphologic changes alone is inadequate to determine the pathogenesis of the disorder. For although, in the opinion of this writer, the picture suggests a toxic disorder it is impossible to prove this on anatomic grounds any more than the mechanisms of anoxia, progressive cellular hydration, etc., suggested by various investigators. It is likely that all these factors coexist, some primary and others secondary.

SUMMARY

1. Fatalities resulting from the use of small doses of insulin are described in (a) subshock treatment of a case of schizophrenia and in (b) tonic treatment of a case of delirium tremens.

2. The clinical and pathoanatomic features in these two cases are identical with those observed in fatal complications of ordinary insulin shock therapy.

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THE PSYCHIATRIC NURSE IN A COMMUNITY MENTAL HEALTH PROGRAM [1]

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Of all the professional personnel engaged in a community public health program the public health nurse has the most frequent and direct personal contact with the population. In the day-to-day course of her activities she comes to know people not simply as cases of mumps or measles, but as actual living personalities, with all of their courage, kindliness, and humor, with all of their fears, hostilities and irrationalities of behavior. This means that the nurse has an impact on the mental health of the community whether or not she is aware of the fact. There is little question of the desirability of specific training in the field of psychiatry to prepare the nurse to deal with the various emotional problems she inevitably meets in the course of her duties.

Many public health nurses have had some specific training in psychiatry. At the present time these nurses can fill the important need of providing supervisory and consultant services for the guidance of the general nursing practitioner. The ultimate goal is to give every nurse training in psychiatry and mental health.

In the brief time at my disposal I shall confine my remarks to the services which a psychiatrically oriented public health nurse offers a community. These contributions fall into 4 general areas: mental health education; recognition of emotional difficulties in their incipient stages; guidance in the optimum use of community resources for mental health; and activity in relation to the mentally ill patient, his family, and the community.

In the field of mental health education, the public health nurse has a unique opportunity for effective service. Her traditional role of providing needed nursing service encourages an intimate relationship to families in the community which enables her to find ready acceptance for the information she dispenses. There are many ways in which she carries out these educational activities. The nurse helps the pregnant mother by teaching her what steps to take for her physical and mental comfort and well being; she stands by the young mother in her first efforts to care for the baby; she helps young parents anticipate the next steps in child development; she points up the role played by individual differences; she helps evaluate and deal with symptoms of illness before the doctor comes and interprets or helps carry out his orders after he has seen the patient.

Mothers are quite accustomed to assistance from nurses in relation to the physical care of children and habit training. These activities provide a direct entry for the nurse to give guidance as to the emotional needs of children for affection and acceptance; for opportunity to have new experience without too much restriction; for allowing the child to make choices and for urging the need for relationships with other children. Through such service the nurse develops relationships with individuals and families which have great potentialities for positive mental health instruction and for helping parents deal with the daily problem of living and bringing up children.

The public health nurse serves an educational function not only in the home but in the clinic, the school, the factory, the office—in fact wherever her services are called for in the community. The well-child conference, morning inspection in nursery school, the school health examination, the 4 H club health program, teaching home nursing in school, acting as health advisor to a campfire group or as a health counselor in summer camps, speaking at PTA meetings and discussion groups—all these activities and many more offer strategic opportunities for mental health education. The attitudes which are developed, the ideas encouraged, the actions recommended may have a far-reaching sig-

[1] Read at the 104th annual meeting of The American Psychiatric Association, Washington, D. C., May 17-20, 1948.

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nificance in promoting individual and community mental health.

A second function which the public health nurse can carry out is to recognize emotional difficulties in their incipient stages, when the chances for successful treatment are greatest. In the course of her regular activities in the fields of health education, prevention of injury and illness, and care of the sick, the nurse comes into close contact with well and sick people of all ages and of various social, cultural, and economic groups. She is in a position to observe and record the interpersonal relationships within the family, the classroom, or the industry. Because she is often in a position to observe the same individual in a variety of settings, she can see under what conditions fears and anxieties develop.

The public health nurse can give parents help in dealing with the anxieties which are a natural part of family life. There is, for instance, the appearance of early feeding difficulties that arise shortly after the arrival of the baby. These are most effectively dealt with if recognized and explained when the nurse visits the home shortly after the mother's return from the hospital. The seriousness of such a problem can be significantly greater by the time a few months have elapsed and the mother brings this baby to a pediatrician for a tonic because his appetite has dropped off—or 2 years later when the psychiatrist is faced with the task of helping Johnny express his feelings of rejection and unhappiness. The psychiatrist then must proceed through the slow and often painful process of reeducation of parental attitudes which have accentuated or prolonged Johnny's reactions.

In a class for expectant mothers, we find other examples of beginning emotional difficulties. Here the skilled nurse leader can make it possible for the class members to verbalize some of their anxieties in an atmosphere in which no question is considered unimportant, and to gain security from a calm objective explanation and from the realization that other mothers have similar feelings of anxiety and insecurity. The nurse learns to sense when comments or questions have more than informational significance to the questioner or when an explanation of anatomical or physiological processes brings forth unusual reactions. These observations can be followed through in individual conferences and, if need be, the mother may be referred for psychiatric therapy.

A third contribution of the psychiatrically oriented public health nurse is to assist individuals, families, or groups to make earlier and more effective use of the therapeutic and rehabilitative resources in the community. Not only can she help overcome ignorance of where to go or what services the community offers, but she can often allay actual fears, misapprehensions, and distrust of the services that are available.

The nurse's identification as a "helping" person inevitably leads to her use as a natural confidant. She plays an important role as a "listener," for the therapeutic effect of telling another person about one's troubles is well known. The psychiatrically oriented nurse knows the therapeutic value of her passive role in these situations. She has developed more security in nondirective interviewing and is also better able to proceed to the more active techniques which require knowledge of what questions to ask and when; when to press for more details and when to remain silent; when to give assurance and when to withhold it. The nurse who is not psychiatrically trained must learn the necessary skills of how to listen, to understand what is being said, and to note the anxieties, discrepancies, and areas of greatest difficulty. The nurse often stands in *"loco parentis"* to the individual. It would be wasteful not to recognize this fact and take advantage of the opportunities which it affords. Just as the doctor in his role of a person of knowledge and authority is aided in carrying out his duties, so the nurse, in her role as a sympathetic and understanding woman, can do much to bring people to the realization of the need for help; can encourage them to seek this help; and can overcome their fears and misgivings in utilizing community resources.

The nurse has had to learn to work effectively with groups as well as with individuals. Nurses have learned that emotional states are often as contagious as physical ills, that groups as well as individuals develop states of panic, vague fears, acute periods of dis-

tress. The nurse's training in the epidemiological approach helps her in discovering, for instance, what is at the source of an avalanche of telephone calls to the agency. She probably knows about the recent radio report of the occurrence of several cases of poliomyelitis in the community. When the PTA suddenly becomes very much interested in a program of sex education, she may find that some mother or teacher has found her children engaged in sex play. Helping people find out what the facts really are, where the hazards lie, and what resources are available for handling the problem is the nurse's share in controlling emotional epidemics.

The final activity of the public health nurse which I want to mention is that which concerns her relationship to those suffering from mental illness. In giving bedside nursing service in the home, the nurse is in a position to observe, report, and assist with the care of the emotional components of physical disease. She also has to work with individuals in various stages of purely functional emotional disorder, for it is common knowledge that far from all the mentally ill are hospitalized. She also has the problem of supporting the mentally ill person, his family, and the community both prior to and following hospitalization.

The nurse does much in reassuring the patient and his family by helping them make the necessary arrangements for medical care and for admission to a hospital. She interprets the nature of treatment given in hospital or outpatient clinic, and gives encouragement as to a favorable outcome when justified. During the patient's hospitalization many puzzling questions arise relating to treatment for the patient, attitudes regarding visits to the hospital or anxieties created by these visits, letters from the patient with which the family does not know how to deal. These are matters in which the nurse helps by allowing the family to share their feelings about the patient, his illness, and the current attitudes in the community toward mental disease. When a nurse has been a visitor in the home throughout this period she can do much to help the family prepare for the patient's return. The community also needs such preparation, especially if the individual is to return to his former place of employment and if his behavior in the past has interfered with his ability to carry that work through successfully.

A psychiatrically oriented nurse can do much to dispel fears based on ignorance of mental and emotional abnormalities which even today are the usual reactions of the majority of the community. She can help the community accept the mentally ill individual as a patient with certain special needs for a temporary period, but essentially a person like any other who has gone through a serious illness. She can help the patient face the misunderstandings and prejudices he may encounter and assist him in seeking himself as part of the educational process to guide the community to better understanding of mental illness.

In the posthospital period the patient frequently needs an opportunity to talk about his relationship to his family and friends. His experience in discussing his family and friends with the psychiatric nurse in the hospital makes the public health nurse in the community a natural resource for follow-up.

In all of the above-mentioned activities there can of course be no sharp line of demarkation. A public health nurse's work is carried out in the framework of a family situation. She has no idea what she will meet when she arrives on the scene, and she must come prepared to deal with the well or the sick, the strong or the weak, the bright or the dull, the rich or the poor. She is working with actual living people, and the better her preparation in nursing and her foundation in psychiatry and mental hygiene, the more help she can be to them.

DISCUSSION

DR. JOSEPH E. BARRETT (Richmond, Va.).—Miss Shalit has given us a very comprehensive outline of what a psychiatrically oriented public health nurse may do. In fact, she may become a panacea for all types of illness, whether at the individual, family, neighborhood, or employment level. If she is sufficiently skillful and of sufficient endurance she might even eliminate the need for the doctor, especially the psychiatrist; but of course this situation is not likely to happen.

Miss Shalit has couched her comments around the public health nurse. I should like to encourage a program that would require all graduate nurses to have had training and experience in dealing with

mental disorders. Every nurse, whether in private, hospital, or visiting practice such as the public health nurse does, must be prepared to recognize and deal with varying degrees of emotional disorders. These conditions are so prevalent and often such a major problem in all types of illness that one is fully justified in the belief that all nursing training should be predicated on an ability to do mental nursing. So much of the nursing techniques in physical diseases has become highly routinized and takes up so little of the nurse's time in so far as the individual patient is concerned that the nurse finds her greatest problem is making her patient comfortable in mind. And this is seldom a routine matter.

I find myself in complete accord with the author's statements of the possible accomplishments of the public health nurse who has a psychiatric orientation; such a nurse I believe could do much excellent work in the prevention of mental disorders which commonly require hospitalization.

How can we acquire an adequate supply of such nurses? In my view, as previously stated, all nursing training should be predicated on an ability to do mental nursing. This would mean that the student nurse should be selected on the basis of her personality in addition to intelligence.

Then where should one get the necessary training and experience that would so equip a nurse? Let us take for example a common physical disease like measles. We know about measles from having followed and worked with this disease through all its stages and recovery. If we saw only the prodromal stage of measles we would not be able to recognize it as such. Neither will we be able to recognize the incipient phase of a psychosis unless we have been able to follow such a condition through all its course with its many complications. Without that experience one is liable to failure in preventive efforts.

In my opinion the place to secure such training is in our large state and private mental hospitals, where there is sufficient variety for one to acquire a broad viewpoint and much specific knowledge. This can most certainly not be obtained at a clinic level.

As a closing comment I would like to urge that we all make a decided effort to see that our state hospitals are equipped and staffed to provide this type of training and experience for all nurses.

THE VALUE OF THE RORSCHACH TEST IN DIFFERENTIAL DIAGNOSES

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The diagnosis of typical or advanced cases of the various psychiatric syndromes is made without difficulty by competent psychiatrists. One's diagnostic acumen is often put to a severe test, however, in the differentiation of early and incipient cases of mental illness. Probably the 3 more common disorders which give the most difficulty in this respect are certain of the psychoneuroses, psychopathic personalities, and the schizophrenias. Often the diagnosis is made principally on anamnestic data and less on the signs and symptoms which may be observable in the patient. Difficulties in the determination of early schizophrenia have been recognized by Polatin and Hoch(1) and of psychopathic states by Karpman(2).

The initial symptoms of these 3 disorders indicate varying degrees of social maladjustment and illogical behavior which are often interpreted and explained by the psychiatrist as pointing to one of these syndromes. Often in staff discussions there may be a division of opinion and consequent difficulty in arriving at a definite decision in determining what the treatment should be. After a lapse of time, varying from weeks to months or even years, the symptoms and findings become more clear-cut and the patient can finally be accurately labeled but, in the meantime, treatment may have been unscientific.

In this type of case the Rorschach test can play the decisive role in the determination of the personality type and diagnosis. Rorschach diagnostics are not by rule of thumb but often when there has been a marked diversity of opinion among psychiatrists the findings according to this test are more definite and clear-cut and point without doubt to one diagnosis rather than several.

Personality types probably do not change. The neurotic, the psychopath, and the schizophrenic have a more or less characteristic way of thinking and deciding problems. The obvious objective behavior as given in the anamnesis may be similar but the motivating power is different. The determination of the type of thinking which motivates the behavior is one of the ways by which the Rorschachist arrives at a diagnosis. The personality and the way a patient thinks and acts is presented to the clinician from a new angle; it can actually be dissected piecemeal. In life there are so many factors influencing behavior that it is difficult to come to any conclusions as to what the real source of trouble is. If it is neurotic, the conflicts will reveal themselves to the Rorschachist not as abnormal behavior but in the objectified manner in which the subject responds to ink blots. The same is true for psychopaths and schizophrenics. The personality is seen in a different light than customary and can be interpreted in a special way.

The diagnosis of psychoneuroses by the Rorschach test has been well developed and essentially hinges on the way the patient responds to the color cards. In neurotics the colors cause blocking and as a result the patient takes seconds to minutes longer than the normal to give a response. Often the form quality[2] is poor or the response may be determined mainly by color rather than form. Just why should neurotics respond to color cards in this way? Undoubtedly the colors, especially the red ones, evoke in the neurotic certain emotional conflicts and complexes in his unconscious mind regarding his own present or past bodily state or of persons or objects in his past or present environment. It is recognized that colors in general stimulate the emotions and neurotics are known to be quite labile and sensitive. The Rorschachist speaks of this phenomenon as color shock.

The psychopathic personality is probably more difficult to determine but here again there are definite indices. Fewer responses

[1] From the Binghamton State Hospital.

[2] The accuracy of the details of that part of the blot responded to in relation to the shape of the real object.

are given than in the mentally healthy. The psychopath, under stress and close observation, is usually quite cautious and no doubt takes the attitude, "what I don't say can't hurt me." As a result, only one or two responses on the average are given to each card. What responses he does give are made in a rather hesitating way. Being too sure of anything might be, in his estimation, too revealing. While being given the test, his thinking is quite rigid. He refuses to use his imagination, or at least to repeat to the examiner his thoughts. As a result, he responds only to the more obvious blot details, which results in the giving of many common, popular, or near popular responses.[3] The above applies mainly to those cases of psychopathic personality whose emotions are fairly well under control. In disturbed psychopaths where the emotions are under less control, there will be, in addition, responses to the color cards determined mainly by color rather than form and indicative of emotional instability and aggressiveness. This unstable emotional state is further indicated by the giving of animal movement responses. It reveals the child-like emotional immaturity of the subject. We all know that children are much more interested in animal form and life than are adults. Aggressiveness is also indicated in this group by the content of the responses such as fighting men, atomic bomb, or teeth.

Schizophrenics are relatively easy to detect. The Rorschach test is very sensitive to the schizophrenic's way of thinking. It will often reveal what the ultimate diagnosis will be when the patient is in the early stages and shows only mild behavior disturbances and when mental symptoms are difficult to detect on examination. The test is so sensitive and reveals so many abnormalities that the examiner might conclude the disease is full bloom and advanced; yet according to the history and after careful questioning, the patient has been making a fairly satisfactory adjustment socially and the objective findings are often not immediately apparent.

The main factor in the diagnosis of schizophrenia by the Rorschach method is that there will be found, without fail in every record, evidence of illogical, irrelevant, and extremely far-fetched thinking. This may be observed in the response to a whole card or a certain detail but even more important is the way he will combine details. There may be the combination of a logical response with an illogical one, or the combining of two logical responses to separate details in an illogical manner. This, of course, indicates lack of reality in his thinking and acting, poor judgment, and lack of ability to see things as a normal healthy individual would. In life he thinks logically when considering only part of a problem or situation but when he attempts to combine his ideas, he arrives at a socially unacceptable solution. Even in intellectually superior individuals, this type of thinking will invariably appear on the record. The other indices of schizophrenia but of secondary importance may or may not be found, namely, the giving of a good response and following it with a very poor one. This is indicative of the unpredictability of the schizophrenic; much of his behavior is normal, yet inconsistencies arise and it is these which indicate to members of his family that he is mentally ill. This inconsistency is revealed also in the number of responses he gives. In cards where there are few readily observable details, he may give several responses, while on cards where there are many details, he may give few responses.

To many psychiatrists the number of symbols used by the Rorschachist is confusing and, as a result, they show little interest in reading about this subject. It has definitely been the purpose in this paper to refrain from symbols and to present material in a way that psychiatrists not intimately acquainted with the test may readily comprehend how the diagnosis of mental diseases by this technique is arrived at. It is essentially a laboratory tool in a similar category with the Binet-Simon or the electroencephalogram. The Rorschach test should be used more frequently as it has a definite value to the psychiatrist in differential diagnosis, although many have been reluctant to accept it.

[3] The response given to a whole or part of a blot by at least one-third of all mentally healthy individuals taking the test.

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GROUP PSYCHOTHERAPY WITH PSYCHOTIC PATIENTS AND THEIR RELATIVES [1]

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At the last annual meeting of this Association the author presented a description of group psychotherapy carried on with the relatives of patients under psychiatric treatment(1). In that project the patients were mostly psychoneurotics or mildly psychotic patients under voluntary admission to the Allan Memorial Institute, and they were being treated by other psychiatrists than the one conducting the discussion with the relatives. The present report involves an extension of the technique, in which the relatives of psychotic patients committed to Verdun Protestant Hospital, the only English-speaking mental hospital for the Province of Quebec, have participated in group discussions with the psychiatrist who was treating these patients by various methods including psychotherapy in a separate group. Various reports have been made of group psychotherapy with psychotic patients, and with patients recovering from psychoses(2, 3, 4, 5). Patients and relatives have also been combined in one group for the psychodrama technique(6), and the psychodrama technique has been combined with insulin therapy(7). This paper will describe experiments in the use of separate psychotherapy groups by the same psychiatrist for schizophrenic patients and their relatives, and the use of the period of greater accessibility following revival after insulin coma in order to facilitate discussion with the patients.

The first project along these lines was initiated for the benefit of several mothers of chronic young male schizophrenics. These mothers had obviously failed to make a satisfactory adjustment to the fact of prolonged hospitalization of their sons. They were a constant source of annoyance to members of the hospital staff because of demands for the discharge of their patient, although his behaviour indicated that he would be impossible to manage at home, and because of other unreasonable requests. These mothers consumed considerable time from the psychiatrist in individual interviews until their group psychotherapy was started, whereupon about 10 of them were given more successful help at the expense of only one hour a week. These mothers were encouraged to talk freely about the previous life of their son and the development of his illness. This procedure provided additional information for use in the handling of the patients other than that obtained in the usual anamneses, but its main objective was the working through of the grief reaction of the mother to her son's illness and hospitalization in a manner analogous to that recommended by Lindemann for assistance in adjustment to the loss by death of a loved one. Some didactic explanations were given to the mothers concerning principles of psychiatry and hospital care, and many questions were answered for them. The principles of healthy parental attitudes were not emphasized in this group for fear of stimulating excessive guilt feelings of responsibility for their son's illness, which were already barely tolerable to them. They were given brief opportunities to ask questions or reveal facts in private interview which they did not wish to discuss in the group, but they became increasingly capable of carrying on all their discussions through the group. These mothers benefited in several ways. They felt less of a "stigma" about having a son in mental hospital because of belonging to a group of women in the same circumstances and because of some enlightenment about mental illness. They were kept informed of the current status of their sons by the psychiatrist, who was also meeting the sons 2 or 3 times a week and directing other treatment. They were able to make constructive suggestions for their sons' welfare instead of unreasonable demands, and some of them came to a point of admitting that they did not expect any dramatic change in his condition in view of the gradual outgrowth of his illness from

[1] Read at the 104th annual meeting of The American Psychiatric Association, Washington, D. C., May 17-20, 1948.

his previous personality. Various members of the hospital staff commented on the improved attitudes of these visiting mothers.

The sons themselves constituted a mixed group of inactive and silent simple and catatonic schizophrenics, and unpredictably impulsive hebephrenics and excited catatonics. The attendants were very reluctant to bring some of the impulsive patients from their single rooms, and they frequently forgot to bring the silent ones, with the explanation that it was of no use anyway. At the beginning, the patients scattered themselves around the large ward being used for the meetings and showed little inclination to relate themselves in a group. The suggestion of the attendant that he round them up in one corner was not accepted by the leader, who began with a nucleus of patients who happened to be the closest together. A permissive attitude was taken towards them, explaining to them that we would have a talk if any of them wanted it but that none of them needed to talk if they didn't want to. Chocolates and jelly beans were handed out at the beginning of several sessions, and questions were asked by the leader indicating solicitude for their welfare. The patients at the periphery gradually moved in during successive sessions and were soon forming a definite group with moderately active discussion and no interference by the impulsive ones. One previously silent one volunteered the topic for discussion as to what are the reasons for existence. Several patients gave their ideas on this subject. A favorite topic for some of them was the question of going home, although others evinced no interest in this. One patient who had been making repeated attempts to escape ceased doing this while attending the group twice a week. Others showed improved behavior during the intervals between meetings, but all of them relapsed again to their previous status when this particular experiment was discontinued. Some of the silent ones never did contribute to the discussion. Others began to open up but with irrelevant, illogical chatter. On the basis of performance in this group, some of these patients were selected for inclusion in the second project.

The second project is being conducted with recently admitted male schizophrenics selected for insulin coma, and with some members of the first group, including two relatively hopeful ones and two very dubious ones to be tried as a challenge. All the chronically hospitalized ones had previously been given considerable insulin coma and electric shock treatment without more than temporary symptomatic improvement. These patients are assembled 3 times a week for discussions in the room where they have their daily insulin coma treatment. The psychiatrist conducting the group is present to take them out of coma, being assisted at this by an interne and a male nurse. The discussion is started when they are all awake and either dressed or in dry night clothes, and it lasts for one hour. For some patients the noon meal is postponed until the end of this time. Others are allowed to eat before the session, depending on experience as to which circumstances facilitated discussion for each patient. Eight patients are treated with coma at one time, but, with a changing population as new patients are added and old ones graduated to convalescence or shifted to modified insulin, there are usually at least 10 or 12 in the discussion. Some of the patients on the coma treatment have to be excluded at times from the group psychotherapy because of overtalkativeness, either in reaction to the insulin or as a phase in their illness. Patients and doctor, and the occasional other member of the staff present, sit around on the beds in an informal grouping, with the leader moving his position in relation to the apparent need for attention in different parts of the room. Over the same period of time the relatives of these patients are assembled around a table in the hospital conference room for sessions of one hour once a week.

Some of the patients appear to be definitely more communicative during the period immediately after revival from insulin coma. Some control sessions were tried without insulin coma and some of the patients had been in the previous group without insulin. Other patients participated better if wakened sooner and allowed to have lunch before the session, especially those at a later stage of recovery and in better social contact. In general the ones more out of contact did better immediately after revival from insulin. Insulin has, of course, been used as a narco-

analytic agent for individual therapy. Some of the less communicative patients vary considerably from day to day but on occasion they take considerable part in the discussion and reveal that they have profited from other sessions in which they remained silent. The common experience of undergoing insulin coma also acts as a bond to cement group feeling, while the therapist's rôle in gratifying their oral needs with glucose as they revive places him in a particularly important relationship to all the patients.

The topics of discussion are not preselected by the leader, although steering is done from starting points by the patients in order to cover topics known to be, or suspected to be, of importance to the patients from their histories or symptomatology, or from the information obtained in the relatives' group. There is a great tendency for patients to ask questions about the insulin treatment, or about the probable period of hospitalization. These are answered in a reassuring manner without allowing too much discussion to be diverted from more fruitful topics. Some of the discussion is rapport-increasing, such as determining the name by which each patient prefers to be called by the leader and by members of the group, or pursuing the pet topics of some members who otherwise might not maintain their interest in the group. Some of it is educational, especially concerning misconceptions held by the patients on the subject of sex, including the topics of masturbation and homosexuality. A good deal of it is insight-promoting, including the subject of the presence or absence of insight, and the explanation of symptoms such as delusions or hallucinations. Patients who have been getting insight into their own psychotic symptoms often argue actively with those who still lack insight. The therapist tries to maintain a neutral attitude in such arguments and to protect any group member who is attacked excessively by others. One paranoid patient has had to be diverted to another activity at this time because of the hostility evoked in the rest of the group by his lack of insight. One can see patients beginning to doubt their delusional beliefs under the social pressure of others in the group, combined with emotional support from the therapist. There is some analysis of the behaviour of individuals in the group setting, such as the attempts of one member to monopolize the discussion or to displace the leader, and the relationships of these to his rivalry with his father. One particular patient who had always been at loggerheads with his father was privately asked to act as a special assistant to the therapist to keep the discussion going, and he showed rapid improvement thereafter. There is considerable discussion of relationships to the parents and siblings in the home to which the patient will return. A favorite topic has been that of racial and religious prejudices, of importance to patients belonging to minority groups. One patient still speaks in schizophrenic chatter but another recovering patient interprets for him and explains his symbolic utterances. There is some talk of dreams and of unconscious aspects of mental experience, mainly to give the therapist more information about the patients, but on the whole the discussions are not deeply analytic. They are aimed more to assist socialization within the group, and in relation to the relatives, rather than to accomplish a complete ventilation and understanding of infantile emotional conflicts. Somewhat more steering of the discussion by the therapist seems to be necessary than with neurotic patients under more direct pressure from their problems. However, these psychotic patients have been able to carry on their sessions on some days even in the absence of the therapist and have reported in minutes some worthwhile discussions in which more recovered patients gave leadership to the others.

The group with the relatives is somewhat differently organized from the earlier group of mothers alone. It includes whatever parents or siblings who are able to attend, with the occasional other relative living in the home. These relatives are keeping in touch with the patient by weekly or biweekly visits, and they provide a link with other relatives in the home, They are given full opportunity to ventilate their feelings about the patient, and they are also given instruction about mental illness, but there is more emphasis in this group on the dynamics of interpersonal relationships in the family, in the hope of helping them to modify attitudes

which may have been harmful to the patient. This is in line with comments which have been made at the sessions on the psychotherapy of schizophrenia with regard to the importance of the attitudes of the relatives. The procedure followed with these relatives is essentially as previously described for those seen at the Allan Memorial Institute(1). In addition, valuable leads are obtained for the steering of the discussions with the patients. Familiarity with the relatives in this fashion certainly impresses one with the deviations which they show on the borderline of psychosis, and which might be interpreted either as representing a hereditary factor or as an obstacle which the patient has to surmount in any efforts at adjustment.

This project is still continuing and there has not yet been a sufficiently long enough follow-up period to compare its efficacy with that of insulin coma accompanied by the small amount of individual psychotherapy possible under the usual conditions of staffing of mental hospitals. Individual interviews are still arranged with both patients and relatives when requested, or when considered advisable by the therapist, but much more seems to be accomplished through the media of the groups than when only individual interviews are held. The technique certainly seems more difficult to carry out than individual psychotherapy, and it is more tiring for the therapist, but if he is able to do it, it saves his total time and energy for other tasks. The desirability of having patients and relatives treated by the same psychiatrist seems to be substantiated by a comparison between these experiments and ones previously carried out at the Allan Memorial Institute.

The combination of insulin coma and group psychotherapy for schizophrenic patients, with the latter for their relatives as well, would appear to be a desirable combined biological and social approach to the treatment of the schizophrenias which is applicable in a practical way in the mental hospital setting.

SUMMARY

Experiments have been described in the use of group psychotherapy with schizophrenic patients in a mental hospital, and with their relatives in a separate group. These were started to help the mothers of young chronic male schizophrenics to adjust to their sons' illness and hospitalization. The mothers benefited considerably, and the sons showed some temporary but slow improvement. Efforts have been shifted to more recently admitted patients being given insulin coma treatment, along with a few of the chronic patients in the initial group. The discussions with the patients are held 3 times a week during a period of greater accessibility following revival after coma. The psychotherapy is rapport-increasing, educational, and insight-promoting, at a level concerned with socialization, but not with deep analysis. The discussions with relatives are aimed to modify traumatic attitudes by them to the patients, and to obtain leads for more fruitful discussion with the patients. The long-term results cannot be reported yet. The treatment of patients and relatives by the same psychiatrist has worked out satisfactorily. The technique is difficult but rewarding, and it appears practical in the mental hospital setting.

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CORRESPONDENCE

PREFRONTAL LOBOTOMY

Editor, AMERICAN JOURNAL OF PSYCHIATRY:

SIR: In the article "The Selection of Psychiatric Cases for Prefrontal Lobotomy" in the August issue of the JOURNAL the authors attempt to lay down definitions and criteria in a situation which is still fluid at best. The result is that conclusions are reached and propositions laid down that cannot be endorsed, much less approved, by the rank and file of the profession.

As yet the very fundamentals of this operative procedure or its modifications have not been stabilized. This is one fact that should be borne in mind. So much so that in the same issue of the JOURNAL, under the caption "Cerebral Topectomy," Dr. Nolan D. C. Lewis states and I quote:

> Responsible psychiatrists have, nevertheless, been most reluctant to apply this neurosurgical procedure to patients under their care for the following reasons: (1) The method is "irrational" in that the surgeon does not know just what he has cut nor what the results may be. There is no basis for predicting which patient will be improved or which worsened. . . . . (3) The undesirable concomitants (convulsive seizures, organic symptoms, mortality rate) which occur in a fair percentage of patients may lead to unpleasant public relations. . . . .

In the light of the above the following statement by the authors would appear unwarranted indeed: ". . . . We can state that the operation never makes the patient worse, and we can promise that the patient will be relieved from a mental suffering which is often agonizing."

One point about the operation that has never been adequately settled and that ought to be brought into the daylight is the following: Is the operation invariably done for the benefit of the patient or is it often undertaken at the insistence and pressure by the relatives? The authors would have us believe that the operation "is considered to be in the interest of the patient." Yet in the same article phrases and sentences such as the following abound: (a) "The benefits of a damaging operation.". . . .(b) "Unpleasant traits will become magnified after lobotomy." . . . .(c) "A lobotomy adds an organic encephalopathy to the schizophrenic changes." . . . .(d) "Even in successfully operated patients symptoms such as delusions and hallucinations are frequently untouched by the operation.". . . .(e) "It should not be overlooked, however, that the operation can never change personality traits.". . . .(f) "The promise that a patient will be enabled by the operation to provide again for his family should never be given because it will lead to disappointment.". . . .

From the foregoing it would appear that enough has been admitted even by the authors themselves regarding the dubious nature and outcome of the operation at present. It is evident therefore that the entire matter of prefrontal lobotomy must for the time being remain *sub judice.* In this connection those interested in the subject should read a recent publication by the Group for the Advancement of Psychiatry: Report No. 6, June 1948, "Research on Prefrontal Lobotomy."

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REPLY TO THE FOREGOING

Editor, AMERICAN JOURNAL OF PSYCHIATRY:

SIR: In his letter Dr. Robins used a technique which is frequently applied in polemics of various kinds, but which hardly helps to solve our therapeutic problems. At random he takes a series of sentences and fractions of sentences unfavorable to psychosurgery from our paper, and then uses our own sceptical remarks to discredit our favorable comments, again taken out of context. The paper was not written for the purpose of taking sides either for or against the surgical methods. It tried to show that by taking all the negative features into consideration,

we can limit the operation to promising cases and exclude those in which it might be harmful. However, it should be freely admitted that, even with cautious selection of cases, failures are still frequent. We stated that "the decision for or against prefrontal lobotomy is more serious than any other decision psychiatrists are called upon to make." This should have saved us from Dr. Robins' doubt whether "the operation is invariably done for the benefit of the patient."

We agree that the entire matter of prefrontal lobotomy "is still fluid at best." Since the writer mentions Dr. Lewis' announcement of the new Brain Research Project we wish to point out that, although Dr. Lewis has always been extremely careful in evaluating the newer treatments, he himself is heading this new research project. There is reason to believe that this elaborate project will clarify many issues in the field of psychosurgery; we only hope that its final results will be accepted without bias even if they do not fit into some popular psychiatric concepts.

The shock treatments should have taught us not to reject any new method because it is based only on empirical facts and seems to be irrational. The rationale of accepted treatments in psychiatry is equally fluid when we realize the widely differing psychodynamic concepts of various schools. There is sufficient evidence that in psychiatry, as in all other fields of medicine, many different therapeutic procedures are beneficial if selected for the right type of patient.

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PRESIDENT'S PAGE

PSYCHIATRY AND PSYCHOLOGY

In the first week in September between two and three thousand psychologists met at the annual meeting of the American Psychological Association in Boston. There are currently 5,047 members of the American Psychological Association, which includes a Division on Clinical and Abnormal Psychology with 1,100 members. These may be surprising figures to many members of The American Psychiatric Association.

Psychology is one of the basic sciences for psychiatry. The clinical psychologists have become our intimate working associates. Many of us regard their contribution as essential to the best practice of psychiatry. One of our leaders in psychiatry has expressed the situation as follows: "The diagnostic function of the clinical psychologist is now so well established in psychiatry that the competent psychiatrist . . . . would no more exclude the special techniques of the psychologist in his diagnostic studies than would a capable internist routinely exclude the findings of the roentgenologist." One of their leaders has expressed the hope "for the clinical psychologist to emerge in a more positive rôle" of what might be called "the assessor, surveyor, or map-maker of the individual's potentialities and resources. Thus his task would not lie in the diagnosis of a neurosis, but rather in a description of the type of personality in which neurotic symptoms were finding expression."

Another group, the social psychologists, have made some major contributions to the better understanding of social forces, discriminatory practices, and many other social problems. The working relationship, however, with the psychiatrists in these fields has been minimal. One of the leading groups of social scientists, the Social Science Research Council, has as its purpose the advancement of research in the social sciences, but no psychiatrist is included on its Board of Directors. (Dr. Adolf Meyer was, for some years, a Director, but is no longer connected with it.)

We in psychiatry need to have a very great concern over the present relationships with the psychologists in regard to treatment. We must open our eyes to the fact that a very large percentage of this group *are doing* treatment. A great majority of their leaders are closely associated with us in psychiatry, but on the other hand there are many who are established in full or part-time private practice as "consulting psychologists" who, regardless of what they or anyone else may call it, are giving treatment. There is a very thin line of demarcation, if any at all, between nondirective counseling and therapy. Physicians appreciate that any relationship of a doctor or any of his staff to the patient is interpreted by the patient as a part of the treatment. Therefore, the psychological examination is, in some instances, definitely a therapeutic as well as an examinational procedure. There are some clinical psychologists who have sufficient experience and training to give effective psychological treatment. But there are many who are doing treatment whose only training has been "picked up" as they went along.

An effort is being made to define and determine the relationships between psychiatry and psychology and in the central focus of this consideration is the problem of treatment. There is a committee of The American Psychiatric Association working with a committee from the American Psychological Association to work out a mutually agreed understanding. On our committee are several individuals who had a Ph. D. in psychology before going into psychiatry. Whatever may be worked out by this committee, however, is still subject to the approval of the members of the American Psychological and The American Psychiatric Associations.

If we are to work out any solution of this problem, it means that many of us have to become far better informed than we have been. We need to do some very careful thinking and some extensive reading. Every psychiatrist interested in this problem should

be familiar with the report of the University Commission to advise on the future of psychology at Harvard, of which Alan Gregg was chairman, and whose report, "The Place of Psychology in an Ideal University," was published by the Harvard University Press in 1947. One of the very important documents is the report of the Committee on Training in Clinical Psychology of the American Psychological Association, under the chairmanship of Dr. David Shakow, published in the *American Psychologist* of December, 1947. The Josiah Macy, Jr. Foundation has made a very great contribution in their series of conferences on "Training in Clinical Psychology," reports of which have been published by the Josiah Macy, Jr. Foundation.

This problem is becoming more critical. Whether some of our psychiatrists like it or not, many psychologists are doing treatment quite outside a medical group. We have two choices: solidifying our relationships, clarifying our misunderstandings, and working closer together; *or* assuming a condemnatory, do-nothing policy.

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COMMENT

RATING AND INSPECTION SERVICE FOR PSYCHIATRIC HOSPITALS

With the completion of the necessary set of standards and a scientifically devised method of procedure, and the appointment of Dr. Ralph Miller Chambers as Director, the long-contemplated Rating and Inspection Service for mental hospitals is ready for operation.

Those who have followed its development, both lay and professional leaders, see in this plan the logical answer to widespread and insistent demands for a generally higher quality of work among mental institutions. Its launching undoubtedly will be recognized as one of the most important steps ever taken in the organization of care for the mentally ill in the United States and Canada. It is fortunate, too, that the plan comes at a time when there is a marked increase in public interest in mental health and in methods of preserving it.

In the appointment of Dr. Chambers, the Central Inspection Board of the American Psychiatric Association has brought to this new service a professional man of exceptional executive ability and of broad experience in mental health work. Superintendent of the Taunton State Hospital in Massachusetts since 1925, Dr. Chambers had previously served as assistant to the Commissioner of the Department of Mental Diseases, in Boston, and as assistant superintendent of the Westboro State Hospital. From 1917 to 1919, as an officer in the Medical Corps, A.U.S., he had charge of the Department of Psychiatry and Sociology in the U. S. Disciplinary Barracks at Fort Leavenworth. A diplomate of the American Board of Psychiatry and Neurology and a Fellow of the American Psychiatric Association since 1920, Dr. Chambers' wide experience as clinician, administrator, and teacher and as chairman of the committee on psychiatric nursing makes his appointment as Director of the Inspection and Rating Service a singularly happy one. A better choice could hardly have been made.

One of the chief values of this Service is that it will stimulate *self-improvement* among mental institutions. It provides that mental hospitals, both public and private, may request inspection by qualified inspectors who will appraise every phase of the work against a set of minimum standards covering plant, facilities, personnel, methods of operation and administration. Following inspection, recommendations will be made and a reasonable time allowed for carrying them out. If improvements are not made within the specified period, the institution will be rated as substandard, thus affording a basis for a demand on the part of legislative and community leaders for appropriations or whatever other measures may be needed.

It is expected that this plan will bring about salutary results similar to those achieved in the general hospital field through the same kind of procedure. It is recalled that in 1918, when the American College of Surgeons inaugurated such a system in the general hospital field, 692 institutions were surveyed and only 89 were approved. In 1947, the total number surveyed was 3,900 and 3,143 were approved.

Besides improvement in the status of mental institutions the plan will also serve to hasten a better public understanding and acceptance of psychiatry and its functions. Such recognition depends in a large measure upon adequate standards provided by mental hospitals and clinics. Public attention has been focussed upon mental hospitals for many years, and for the most part not favorably. As these institutions improve, public confidence in psychiatry itself will improve. We are faced at the present time with the paradox that, while psychiatry in the abstract has been absurdly overplayed and overpopularized, psychiatry in its very *fons et origo*, namely, the services of the mental hospitals, has not measured up to the extravagance with which it has been advertised.

The Rating and Inspection Service has been made possible through grants made to the American Psychiatric Association by the

Psychiatric Foundation. It occupies first place in the list of the Foundation's five major activities, of which the other four are: (1) education as to the nature and treatment of mental illness, (2) aid in the expansion of training facilities for psychiatrists and assistants in allied fields, (3) promotion of research, and (4) assistance to individual communities in establishing psychiatric clinics and other facilities for better mental health.

But it must be understood that all these activities are interrelated and that the last four are contributory to the effectiveness of the first. It is through vigorous action in these four fields that recommendations made to mental hospitals by the Rating and Inspection Service may be implemented. The Foundation realizes that there would be little point in recommending larger staffs of psychiatrists and qualified assistants if no such professional personnel is available; hence the emphasis upon the expansion of training facilities. Similarly, it would be pointless to recommend closer attention on the part of institutional staffs to the results of current research without making sure that a well-organized and coordinated program of research is in progress, with suitable arrangements for the interpretation and dissemination of its findings, hence the Foundation's plan to stimulate research and to encourage the educational work. The educational program must be many-sided, aimed at acquainting the general practitioner in medicine as well as the lay public with the latest information on the nature of mental illness and up-to-date methods of dealing with it. And it is obvious that institutional case loads are much more likely to be lightened if community clinics and other facilities are available for preventive work and early treatment of incipient cases, thus enhancing the volume and value of extramural psychiatry.

It should be made clear, then, that as the Rating and Inspection Service is launched the Psychiatric Foundation is endeavoring also to make possible the means by which this service can be made fully effective.

The position of Deputy Medical Inspector for the Central Inspection Board of the American Psychiatric Association is now to be filled. Psychiatrists with experience as superintendent or assistant superintendent are eligible to apply. Applications should give a full record of experience and should be sent to Dr. Ralph M. Chambers, Chief Medical Inspector, Room 412, 1270 Avenue of the Americas, New York 20, New York.

THE RÔLE OF PSYCHOTHERAPY IN ELECTROSHOCK THERAPY

Many deplore electroshock therapy as the "sole therapeutic agent to the neglect of a complete psychiatric program," and also its immediate use before adequate psychotherapeutic attempts. There is great need for research in combined psychometric, psychodynamic, and physiologic studies which will lead to a greater understanding of the rôle of psychotherapy in electroshock therapy.

Since electroshock therapy is of little proved value except to relieve severe affective disorders, investigation of the rôle of psychotherapy in electroshock should primarily concern these disorders. It appears that psychotherapy has a definite place along with convulsive shock in treatment of these disorders. First, it aids the patient to accept the need of treatments. Second, it stabilizes emotional adjustments after treatment, especially dissolves residual anxiety, and perhaps prevents relapse after treatment. While it is an empiric clinical observation that psychotherapy aids in such management, there has been no submitted scientific proof.

Affective disorders should be classified into nosologic entities or reaction types all can agree upon. The following classification is suggested:

1. Acute reactive (psychoneurotic depression).
2. Manic-depressive states (elation as well as depression).
3. Involutional depression (also presenile).
4. Schizo-affective admixtures (catatonics and paranoids with predominant affective features).

The types of electroshock therapy with

various modifications of technique would likewise have to be agreed upon. As the physiochemical changes vary with techniques, likewise the psychotherapeutic implications vary with different modifications, *e. g.*, brief stimulus vs. conventional technique, pretreatment curarization or barbiturate medication.

Research projects set up for a study of these various types—one group with and one without intensive psychotherapy—should be followed for 5- and 10-year periods by use of careful statistical methods, to evaluate final results. Such investigations to obtain accurate information are exceedingly difficult.

The statistical analysis should include the duration of illness and any previous treatment and results; compare the type of recovery (either complete with insight or social with residual symptoms) in current illness; and assess how much the result is due to shock and how much to psychotherapy. Such a study assumes a cooperative endeavor by a number of clinics on hospitalized patients only, with comparable patients and techniques in order to obtain sufficient data of value. Ambulatory patients could not be satisfactorily controlled.

Analyses of results should define what is considered in psychotherapy: for example, the intuitive or empiric psychotherapy employed by the resident physician, nurses, aides, and other attendants and the effect of their esprit de corps. The rôle of the patient's family relationships and the effect of other adjunctive therapies such as narcoanalysis, subshock insulin, hormones, drugs, and other medicinal therapy must be considered.

Other patients' reactions to treatment affect the patient favorably or unfavorably. These considerations involve a new concept of a special type of group psychotherapy, namely the rôle of good or bad hospital management and its influence upon recovery.

The first type of scientific psychotherapy is the preparation of the patient for shock therapy. For example, the use of such terms as shock, convulsions, etc., may be traumatic; and the effect upon the patient of literature he may have read may be adverse. In general, the preliminary handling of the patient's anxiety about treatment is a research project in itself, along with definition of basic principles of management. Likewise, the effect or value of psychotherapy in the posttreatment confusional state needs study. Important questions in need of answer are: Of what value is active psychotherapy during the treatment program, at a time when treatments are producing amnesia and organic psychotic reactions? During treatments what is the rôle of activity or total push programs and their psychotherapeutic effects?

At the end of electroshock treatment the second type of scientific psychotherapy is indicated, attacking the basic illness. Two types of therapeutic projects should be set up here: (1) Brief psychotherapy of the simple, reeducative, suggestive and persuasive form, to determine whether this is sufficient, since much previously important conflictual material of the patient seems to be resolved after restoration of normal affective reactions. (2) Psychoanalytically oriented therapy with deeper probing, for patients lacking in insight, in order to determine the most effective means of resolving anxiety and the degree of change possible in the basic prepsychotic personality. A third therapeutic project should be the effect and value of group psychotherapy for these patients. The rôle of authoritarian positive advice about social and occupational, educational, and sexual adjustments must also be evaluated, as well as the value of bibliotherapy.

The retreatment upon relapse must be considered, *i. e.*, when should psychotherapy stop and physiologic treatment begin again.

Another factor to be considered is the physician—his enthusiasm about shock treatment, finesse in management of the patient, and avoidance of psychic trauma to the patient. How much do these contribute to the therapeutic result? Individual prescription according to the indications and personal needs of the patient will always be necessary. No routine treatment can be prescribed, but such research studies might achieve certain basic principles of psychotherapeutic management as a guide for all.

A. E. BENNETT, M. D.

NEWS AND NOTES

MENTAL HOSPITAL COSTS.—Estimates of the Mental Hygiene Division, U. S. Public Health Service, indicate that during 1947 the cost of long-term care of patients in mental hospitals in the United States was approximately 400 million dollars. This figure represents an increase of nearly 65% since 1945. The annual cost per patient in all hospitals, public and private, was estimated at $470 in 1945, $556 in 1946, and $731 in 1947. The annual cost per patient in state, county, and city hospitals on the one hand and veterans neuropsychiatric hospitals on the other were respectively $391 and $846 for 1945, $440 and $1,279 for 1946, and $549 and $2,133 for 1947. The annual per patient costs in private hospitals for the same three years were estimated at $2,000, $2,214, $2,500.

While these increases reflect in large part the increases generally in price levels, the report states that they may also reflect to some degree improvement in the quality of mental hospital care during the postwar period.

CONFERENCE ON SCIENCE, PHILOSOPHY, AND RELIGION.—The Ninth Conference on Science, Philosophy, and Religion and Their Relation to the Democratic Way of Life was held at the Men's Faculty Club, Columbia University, Sept. 7-10, 1948. The theme of the conference was, "What Should Be the Goals for Education?" It is expected that the papers presented will later be published in book form as in previous conferences.

The address of the Conference on Science, Philosophy, and Religion is 3080 Broadway, New York 27, N. Y.

ADVISORY COUNCIL, N. Y. STATE DEPARTMENT OF MENTAL HYGIENE.—Commissioner MacCurdy has announced the appointment of an advisory council to his department. This advisory council, representing various aspects of community activity in the fields of psychiatry, social welfare, general medicine, and public health, was appointed to advise the Department of Mental Hygiene in the expansion of New York State's mental health program to deal with the ever-increasing community needs. The council will meet with the Commissioner monthly.

Dr. Howard W. Potter, professor of psychiatry at the Long Island Medical College, New York City, is chairman of the council. Other members are Dr. Edward A. Sharp, psychiatrist in private practice, and consulting neurologist, Buffalo; Dr. S. Bernard Wortis, professor of psychiatry, New York University College of Medicine, who represents the N. Y. State Medical Society; Dr. J. Lawrence Pool, neurosurgeon, Neurological Institute, New York City; Dr. L. Whittington Gorham, formerly physician in chief at Albany Hospital and professor of medicine at Albany Medical College; Marian F. McBee, psychiatric social worker and executive secretary of the New York Committee on Mental Hygiene; Ralph King, president of the N. Y. State County Welfare Association; and Henry J. A. Collins, Judge of the Children's Court in Nassau County.

Among the special interests of the council will be the mental health of children and amplification of facilities for child guidance, greater provision for care of mentally ill patients in general hospitals, and more extensive programs of mental care through cooperation with the medical profession generally.

"This advisory council will be of great assistance," Dr. MacCurdy said, "in forming a departmental community policy, as well as cooperating with the new Federal program under the national health act."

COURSES AT WALTER E. FERNALD STATE SCHOOL.—Included in the Fourteenth Postgraduate Seminar in Neurology and Psychiatry at the Walter E. Fernald State School, Waverley, Mass., will be a course in pediatric neuropsychiatry (child psy-

chiatry). This course will be given on Tuesdays, October 26 and November 9, and then on Mondays, November 22, December 6, and from March 14, 1949 until May 9, every second week from 6:00 p. m. to 9:30 p. m.

DR. TARUMIANZ PRESIDENT OF DELAWARE MEDICAL SOCIETY.—Dr. Mesrop A. Tarumianz, a senior Fellow of the American Psychiatric Association and chairman of the committee on psychiatric standards and policies, has been elected president of the Medical Society of the State of Delaware. This well-deserved honor is in recognition of the splendid service Dr. Tarumianz has rendered the state for many years both as superintendent of the Delaware State Hospital and as an outstanding medical officer interested in promoting the health and welfare of the citizens of the state as a whole.

DR. MILTON SENN APPOINTED PROFESSOR AT YALE.—Announcement has been made of the appointment, effective July 1, 1948, of Dr. Milton J. E. Senn as Sterling Professor of Pediatrics and Psychiatry and director of the Child Study Center at Yale University. It is planned that the Child Study Center will continue in part the Yale Clinic of Child Development, which heretofore has been under the direction of Dr. Arnold Gesell, and in addition, through its clinical services for children of all ages will provide research and teaching media for students from professional disciplines interested in growth and development, and behavior and personality of the human organism.

Dr. Senn, who edited the volume "Problems of Early Infancy," published by the Josiah Macy, Jr. Foundation, has been associate professor of pediatrics at Cornell Medical College, and on the staff of the Payne Whitney Psychiatric Clinic of the New York Hospital.

EXPANDED RESEARCH AT INSTITUTE OF LIVING.—In connection with developments in the new services in child psychiatry and neurosurgery and with expansion in electroencephalographic research at the Institute is announced the appointment of Dr. Charles E. Henry as director of the division of electroencephalography.

Dr. Henry was previously associated with the Institute for Juvenile Research in Chicago and has had extensive experience in electroencephalography and allied fields.

MENNINGER FOUNDATION SCHOOL OF PSYCHIATRY.—The Executive Committee of the Menninger Foundation School of Psychiatry (psychiatric teaching division of the Institute of Psychological Medicine) and the Winter VA Hospital in Topeka are accepting applications for admission to the School on January 1, 1949, available only for doctors who have had some psychiatric residency training in an approved hospital and who can therefore qualify for advanced standing. Those accepted will be placed in the class which entered July 1, 1948. Applications should be made to Dr. Bert E. Boothe, Director of Professional Education, Winter VA Hospital, Topeka, Kansas.

MCGILL UNIVERSITY COURSES IN PSYCHIATRY.—The Department of Psychiatry at McGill University, Montreal, is expanding its courses of training for postgraduate students in psychiatry in order to meet the increased demand for such training arising from the establishment of Dominion Provincial Health grants. These courses are designed to provide, through the various teaching hospitals affiliated with the University, a general preparation for all aspects of the psychiatric field. Arrangements can also be made for experience in any branch in which the student has a primary interest, such as community psychiatry, general hospital psychiatry, psychotherapy, research, intensive therapy of earlier cases, or continued care of institutional patients.

The qualifications for admission to the courses are (1) a degree from an approved medical college or school, (2) a general interneship of one year's duration, (3) a satisfactory personal interview or, where this is impossible, adequate recommendations.

The following courses have been set up:

A: The four-year McGill diploma course.

B: Courses of a general nature, ranging from periods of one to four years.

C: Courses of special instruction to be

arranged through discussion with the departmental committee.

Further information may be obtained by writing to the Chairman of the Department of Psychiatry, McGill University, Montreal, Quebec.

Courses of instruction have also been organized for psychiatric social workers and for graduate students in psychiatric nursing. Information concerning these courses may be obtained by writing to the McGill School of Social Work and the Graduate School of Nursing at McGill, respectively.

VEREIN FÜR PSYCHIATRIE UND NEUROLOGIE IN WIEN.—At its 1948 annual meeting the Vienna Society for Psychiatry and Neurology elected the Editor of the JOURNAL to honorary membership. Dr. Otto Kauders, professor in the University of Vienna, is president of the Society, Dr. Erwin Stransky is vice-president, and Dr. O. H. Reisner is secretary.

EDUCATIONAL FILM ON CEREBRAL PALSY.—Funds totaling $25,000, for production of an educational film on cerebral palsy, will be raised by the National Association of American Business Clubs within the next four months, F. H. Bachman, Champaign, Illinois, president of the organization, has announced.

The film, which will be produced by National Society for Crippled Children and Adults, will be available to all interested persons and groups. National Society is the only national agency operating a program of treatment and rehabilitation of the country's cerebral palsied persons. It is a federation of more than 2,000 state and local units in the United States, Alaska, and Hawaii, formed to serve the nation's 23,000,000 handicapped persons, of whom a half million are cerebral palsied.

The American Business Clubs adopted cerebral palsy as a national project in 1947. At their annual meeting this year, the Clubs voted unanimously to raise $25,000 for an educational film to tell the story of the treatment and training required to rehabilitate cerebral palsied persons, who suffer from damage to centers of the brain governing muscular control.

BOOK REVIEWS

PSYCHOSOCIAL MEDICINE: A STUDY OF THE SICK SOCIETY. By *James L. Halliday.* (New York: W. W. Norton & Company Inc., 1948.)

In this book Dr. Halliday gives his interpretation of the meaning of social medicine. He has attacked the problem of psychosomatic disorders from the point of view of their increasing frequency and their relation to various social changes that have taken place in the past few generations.

The book is organized in 3 sections. In the first section, entitled Medical Logic, "some principles of etiology" are discussed. This consideration centers about the psychosomatic factors in morbidity and mortality. There is little new in this section. Most of it is well known to anyone who has followed the literature on this subject in the standard journals where it has been discussed many times and in a much more readable fashion. As presented, this section would be anything but logical to one who was not familiar with this trend of thought and rather difficult to follow for anyone who is.

In the second section psychosomatic medicine is discussed, primarily from the epidemiological point of view. The general trend of incidence of the various disorders usually included under this field are considered. For those who have not read the author's articles in the various journals over the past 10 years there is a considerable mass of interesting and thought-provoking information. The material under discussion is derived primarily from British sources, but the information and conclusions would apply equally well to other countries at a similar level of social development. This discussion brings out the important fact that psychosomatic disorders must be considered from the mass point of view as well as the study of the individual patient. Dr. Halliday, through his intimate contact with the British Health Insurance scheme is in a unique position to contribute to this aspect of these conditions. Although one might feel that the author's conclusions frequently go beyond the available information this section of the book can be recommended as a useful contribution to our knowledge.

The final section of the book deals with "the sick society." An attempt is made to consider the changes in the structure of society that are related to the increase in the psychosomatic conditions that have been discussed in the previous section. It represents an attempt at the analysis of social change by a physician. A great deal of this section is based on a consideration of the decrease in birth rate that has taken place over the same period that has been associated with the rise in psychosomatic disorders. He believes that the decrease in birth rate is "almost always associated with an underlying neurotic anxiety." Since family limitation is almost universal this would be using "neurotic anxiety" in a very broad sense. There would appear to be considerable confusion on the differences between correlation and causation.

In many ways this book represents a worthwhile attempt to outline a concept of medicine that is becoming increasingly prominent in English writings. However, it deals with a relatively limited aspect of the subject and many important sections are entirely neglected. Although the period under discussion is also associated with a marked decrease in the infectious diseases which cannot be entirely accounted for by preventive procedures, this is not mentioned despite the fact that the literature on this aspect is voluminous and informative. Also the material as presented lacks organization and synthesis. It appears as a mass of relatively unrelated information rather than a well-integrated presentation of an important and fascinating subject. Finally, in many places the book is very difficult to read, due to a peculiar round-about method of expression. For example, in discussing tuberculosis, the author states, "in its etiology the relevance of the tubercle bacillus is absolute." One would have thought that it would have been easier to state that the tubercle bacillus causes tuberculosis.

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PSYCHIATRY—ITS EVOLUTION AND PRESENT STATUS. By *William C. Menninger, M. D.* (Ithaca, New York: Cornell University Press, 1948.)

In 1923, the will of Hiram J. Messenger, B. Litt., Ph. D., of Hartford, Connecticut, provided for an annual "course or courses of lectures on the evolution of civilization, for the special purpose of raising the moral standard of our political, business, and social life."

In accordance with the founder's wishes, in the fall of 1947, Dr. Menninger delivered 3 lectures at Cornell University, this book being a report of the series.

In his first lecture Dr. Menninger presents a concise history of the development of psychiatry as a branch of medical science. There have been many such histories written during the past few decades, but Dr. Menninger has very ably presented in abstract form a digest thereof and has, in bringing the story down to date, discussed psychiatry's many implications and ramifications under such chapter subtitles as, "Psychiatry and Medicine," "Psychiatry and Psychology," "Psychiatry and Social Work," "Psychiatry and Anthropology," "Psychiatry and Sociology," and "Psychiatry and Religion."

Chapter 2, the report of the second lecture, deals with psychoanalytic psychiatry and its contribution to the understanding of behavior. The author has cleared up many common misconceptions of Freud's formulations and in a very simple and understand-

able fashion has outlined some of the more generally discussed theories of complex formation and mental mechanisms under such headings as "Psychosexual Development," "The Unconscious," and "The Id, Ego, Super-Ego Relationship." He gives two reasons as justification for this presentation of the fundamentals of psychoanalysis as follows:

"First, although these facts are widely known in psychiatric circles, their greatest importance is to medicine as a whole. Unfortunately, to date the average physician has not had even a working understanding of the unconscious. Second, a more adequate knowledge of ourselves should enable us to live richer and more satisfying lives. Consequently, it should be made readily available to the average man."

The third chapter, "Psychiatry and the Social Order," to this reviewer proved the most interesting and original. In his usual inimitable fashion Dr. Menninger has indicated how psychiatric knowledge and techniques may be utilized to good advantage toward the solution of the many problems of a chaotic world. He opens the chapter with the following statement: "To formulate the relationships between the actual and potential contributions of psychiatry and our present social order is a challenging task and a formidable one."

With courage and firm conviction Dr. Menninger accepts the challenge, the result of which produces an erudite discussion of the various fields in which psychiatry may, can, and actually does contribute to a better understanding of man in an ever-changing environment.

He very skillfully outlines the manner in which psychiatry attacks the matter of the individual; discussing his personality and how he reacts to the problems of everyday life, in the home, the school, the factory, etc. The family, the community, and industry are considered. The problems of criminology, of our educational system and of public health receive attention.

The closing paragraphs are so beautifully expressed that we feel they bear direct quotation:

"If ever we are to make serious and extensive reforms in our social order, if we are to accomplish the solution of many of the problems outlined in this discussion, it will only be because groups of us can develop a social consciousness that eclipses our individual wishes. If we as individuals could become sufficiently mature emotionally and intellectually, if we could choose our leadership wisely, if we could educate ourselves to the problems at hand and identify ourselves sufficiently closely with the group to forego our individualism—if we could do all of this, we could eradicate even the greatest of our social problems. At the same time we could eliminate a very large percentage of our mental ill health.

"Such a state would surely be Utopia. No psychiatrist is such a dreamer that he believes this is possible. Nevertheless, his job with his individual patients or in discussing the social problems of our troubled world is to help in facing reality as it exists in the problems of day-by-day life. His potential contribution, however, is to point out not only the psychopathology of everyday life, but also some of the factors that cause it and some of the factors that might tend to correct it. This has been my attempt in the presentation of the relationship of psychiatry to the problems of our social order."

Psychiatrists, physicians, psychologists, and social workers should find this volume interesting and stimulating. It portrays, on the part of the author, not only vast experience in, and a deep understanding of, human nature but a broad vision of psychiatry and its future in the development of a better and happier world.

HARRY A. STECKEL, M. D.,
Syracuse, New York.

TELEPATHY AND MEDICAL PSYCHOLOGY. By *Jan Ehrenwald, M. D.* (New York: W. W. Norton & Company, 1948.)

The book before us is a successful endeavor to give the medical and psychological public a bird's eye view of both the experimental and the clinical work in extrasensory perception.

As a neuropsychiatrist, Dr. Ehrenwald became interested in reports by an Esthonian medical man pointing to telepathic results with a little girl suffering from "word-blindness." This led Ehrenwald first to a systematic study of the findings; secondly to a broad theoretical formulation of the possibilities; and thirdly, after his departure from the continent to Great Britain (where he served in several neuropsychiatric posts), to a more general formulation of the place of telepathy in psychiatric practice. The present volume is the fulfillment of this third aim, while at the same time making clear the steps taken under the first 2 headings.

The volume begins with a discussion of the experiences of preliterate peoples with regard to telepathy and proceeds to a rapid summary of modern British and American experimental work, and plunges into an extensive study of the problem of unconscious factors which underlie the process. Here the Esthonian girl with her congenital word-blindness is described, and the theory is developed that her defect promoted in her an extraordinary need to be able to read under any conditions which life permitted, so that when her mother in another room silently gazed at a word, the child through her psychological closeness to her mother was able to grasp it. A "minus function" of the organism is successfully transcended. This theme of the minus function and its successful compensation reappears throughout the entire volume. Much evidence is given to show that the whole process is unconscious, the subject not knowing how he succeeds; the messages appear suddenly in the consciousness or motor expressions of the subject when they are needed, as if to attest a type of "omnipotence."

A chapter on telepathy in dreams is next presented, with clear and accurately transcribed accounts of well-known spontaneous cases of telepathy between persons widely separated in space. In a chapter on telepathy in the analytic situation, the emotional relationship of physician and patient, and

the rich system of unconscious psychic interconnections between them, is noticed; and an attempt is made to show that psychoanalysis, and, in fact, every system of psychology, must find a place for unconscious telepathic interchange. It is emphasized in this connection that the classical mode of reception considered favorable for telepathy, that of deep passivity, reminds one of Freud's advice to the analyst to make himself "passive to the patient's unconscious." From this point Ehrenwald finds it necessary to go forward directly to the vast role which the unconscious plays in mediumistic trance, with evidence appropriately drawn from British studies of the psychology of spiritualistic mediums.

A series of chapters follows on the relation of telepathy to various clinical entities, such as paranoia and schizophrenic deterioration, suggesting that telepathy is particularly likely to occur in certain pathological conditions because of the minus function for which compensations have been attempted. Here follows a venture which is unique in the literature of psychical research, namely, a psychological survey of personality structure in cases of special sensitives. There are 2 of these case studies, one relating to a well-known medium of 20 years' experience, the other relating to a highly successful subject in experimental telepathic tests. For the psychiatrist, a brief condensation of this material would not serve the purpose. It is already as short as it can be made without an arbitrary schematization. But emphasis is placed upon the fact that telepathic phenomena are regarded as serving a purpose, and as fulfilling a role; not as a bizarre, mystic, or unexplainable process. The book concludes with some broad vistas relating to the role which an understanding of telepathy might play in a psychiatry and psychology more broadly oriented to man's possibilities.

The chief weakness of the book is the overconfident presentation of certain interpretations which, while highly ingenious, do not at all exhaust the possibilities. The suggestion, for example, that telepathy serves an immediate personal need relating to the *individual character structure* leaves out of account the possibility that various broader needs shared by *all* human beings may be important. The universality of telepathic phenomena, strongly suggested, for example, by the experimental work of Carington [1] points also to the importance of various other psychological factors, such as the classical laws of association. Telepathy appears to be an aspect of the entire psychological system and, as far as the data go, seems to obey most of the same dynamic laws which psychiatrists and experimental psychologists have secured.

Objections of this sort are, however, trivial in the face of the major contribution made. In medicine, and in psychology, hypotheses are needed which permit objective and rigorous testing, a testing which can be repeated over and over by qualified observers. The important thing about Ehrenwald's book is not the summary of data, but the formulation of hypotheses for physicians, and in particular for psychiatrists; for they alone are often the ones capable of putting these to the test. The alert observer will be able to make observations which will test, redefine, and improve upon present formulations, slowly bringing about a situation in which there is no more tendency to show alarm or shock when confronting telepathic phenomena than when confronting phenomena of sexuality or aggression. When the attitude is as dispassionate, the data as carefully checked, and the results as broadly viewed, we shall have a far richer conception of human nature. Ehrenwald's book does a great deal to indicate the direction in which such a development may be expected to move.

GARDNER MURPHY, PH. D.,
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[1] Carington, W. Thought Transference, 1946.

YOUTH IN DESPAIR. By *Ralph S. Banay, M. D.* (New York: Coward-McCann, Inc., 1948.)

Dr. Banay has approached the problem of juvenile delinquency in a comprehensive and feeling manner with deep conviction and at times despair over the present handling of the problem in our society. As he so aptly states, "Investigation of deviant behavior has tended to emphasize the sociological aspects of the problem of delinquency, and ascribe the causes of poverty, lack of parental guidance, 'broken homes' and undesirable associations as primarily and directly responsible. Relatively little attention has been paid, on the other hand, to the complexity of the inner environment, with its conflicts and propelling forces within the inadequately formed personality. Efforts to analyze and evaluate the forces that play upon and distort the development of the immature psyche have been too few."

It is with the latter aim in view that the author has directed his attention in this volume toward the understanding of the behavior of "juvenile social deviates" and attempts to put forth a philosophy concerning their handling and treatment.

This book attempts to analyze juvenile delinquency according to the legal, social, and medical aspects. It begins and ends with the legal aspects and herein, according to the author, lies one of the still serious lags in our handling of the problem because of outmoded laws and "confusion of tongues." His arguments are convincingly presented and illustrated by the skillful handling of case studies.

While one would not question the validity of the arguments regarding the outmoded legal machinery, one does question whether there would be universal acceptance of some of the author's statements, such as, "at birth the child is completely 'uncivilized'; his reactions are completely animal and egocentric." He further states, in describing the "natural behavior of children," "the child is cruel, autoerotic, completely shameless." At another point, in describing child development, he refers to the fact that the "infant is all sex." It would seem wise, from this reviewer's viewpoint, to put the medical body of knowledge of human behavior into more acceptable form and agreement before it can be effec-

tively presented to and used by another professional body which likewise has a great stake in society's welfare.

A substantial portion of this book is devoted to an analysis of the sociological aspects of the problem of juvenile delinquency. It is with clarity and penetrating insight and balance that the subjects of war, poverty, race, and religious prejudice are dealt. The psychological implications of the problems of children and the family with the interactions between the social and psychological forces are presented. It is in this area that there might not be general agreement with the author as he analyzes the family, but as he translates his knowledge and social studies of juvenile delinquency into an analysis of "who are the delinquents" one feels that he is on surer and less controversial grounds. He does a very credible job in applying the knowledge of his studies and his wide experience in this field to proposing methods of dealing with the problem of juvenile delinquency as it now exists and in a more long-ranged plan for its future alleviation.

Despite the despairing nature of the title of the book there is a great deal brought out which substantiates a belief that progress is being made in this field, and it is in many respects a most informative and progressive study.

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THE STUBBORN WOOD. By *Emily Harvin*. (Chicago: Ziff Davis Publishing Company, 1948.)

It is claimed that this work of fiction is founded on factual conditions and that the author once served as an assistant to an administrative officer in the department of institutions of a western state. The heroine, the wife of a prosperous architect, and the mother of 2 children, arrived at her fourth sanitarium 6 months after a miscarriage which it is inferred was brought on partly by the conduct of her husband, who alternately loved, neglected, and even abused her, and who drank too much and became increasingly interested in other women.

The character of the first 3 sanitariums and what happened in them is not described. The fourth was an expensive place for the mentally ill where the heroine, now supposed to be insane, was subjected to intense mental cruelty and some physical abuse. After about a month her relatives were persuaded to remove her to another expensive place where conditions were little better.

It is claimed that at these 2 institutions the doctors lied to her relatives as to her true condition. They refused to make the physical examinations that would have disclosed she was physically rather than mentally ill. Both physicians and nurses made sarcastic, cutting, inconsiderate remarks that deeply wounded her. She was given a great deal of sedatives that upset her and there was an attempt at psychoanalysis that the patient resented because of some sex implications, but no real treatment. In desperation she made attempts at suicide. Finally the husband, weary of the expense, had her committed to a state hospital.

There is a good description of the routine commitment procedure with its traumatic implications for the sensitive patient. It is justly described as a trial. The patient's brother and aunt who were present with the husband during these procedures were either lulled into the belief that she was insane or were too overawed by the environment to do anything about it.

The state hospital was a drab, overcrowded, poorly furnished, undermanned place, in which the morale of the patients suffered from lack of privacy and poor clothing. They had only a spoon with which to eat their meals and had to put up with other unnecessary deprivations, but the heroine of the book was treated better and was happier than at the sanitariums. She was in "financially disinterested hands" and there was no "system on the part of the nurses (not to mention the doctors) of amusement at the expense of the helpless" as there had been at the sanitariums.

Whether she was treated kindly or with indifference and hostility at the state hospital depended upon the attendants in whose wards she happened to be confined. Finally an understanding, kindly physician took charge of her case. He soon discovered that she did not belong in a mental hospital and saw to it that she was paroled in spite of objections on the part of her husband.

One gets from this book the picture of a paranoid type of patient who magnifies irritations and never gains insight. It would be a better book if mental illness were frankly admitted as in the case of some other books about former mental patients. In spite of its exaggerations, we get from the book lessons that are already well known but are too often ignored in practice: They are that mental patients are harmed by the attitudes of indifference and hostility and soothed by kindly interest and attention given in an atmosphere as homelike as is possible to make it.

If by reading this book hospital administrators are brought to see more clearly the importance of indoctrinating personnel with the correct psychological approach to patients, and legislators learn the harmful effects of niggardly financial support of mental hospitals, it will serve a good purpose.

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